

Metal Finishing

POLISHING AND BUFFING • BARREL FINISHING • CLEANING
PLATING • ANODIZING • RUST PROOFING • LACQUERING & ENAMELING

MAY, 1958

CONTENTS:

Electroplaters to Meet in Cincinnati



Complete Program Section

**Factors Affecting Residual
Stress in Electrodeposited
Metals**

A Critical Evaluation of Influential Factors

Finishing Pointer

*Use of a Nickel Plating Bath as an
Analytical Standard*

**Science for the Coatings
Technologist**

Metallic Pigments

Science for Electroplaters
Organic Chemistry

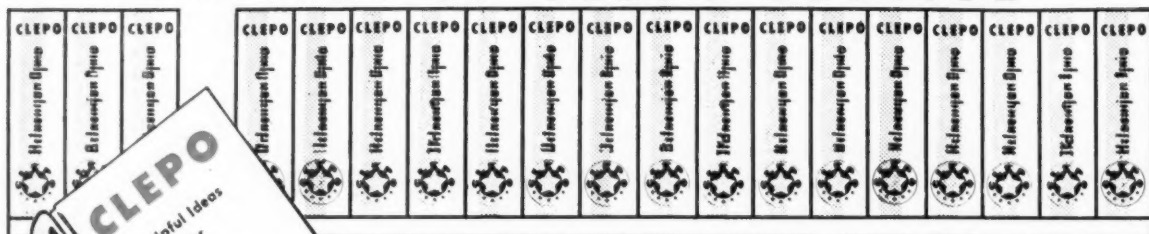
Phosphating Treatments

A Comprehensive Patent Literature Survey

Complete Contents Page 67

Read and pass on —

LIBRARY OF CLEPO SERVICE



UP
TO
THE
MINUTE
IDEAS ON



the Clepo
**BARREL
FINISHING
MANUAL**

published in the interest of better barrel finishing
FREDERICK GUMM Chemical Company Inc.
400 WEST STREET, KEARNY, N. J.

NEW THIRD EDITION

BARREL Finishing

Here's a handbook full of information on barrel tumbling . . . designed to help the man who has to produce results. It's guaranteed to take a lot of the mystery out of barrel tumbling. Write us today for your copy.

Typical sections:

- types of media and their application
- size of medium and how it effects results
- operating cycles
- compound classification
- work-to-medium ratios
- compound-to-load requirements
- multiple operation procedure
- self tumbling applications
- ball-burnishing operations

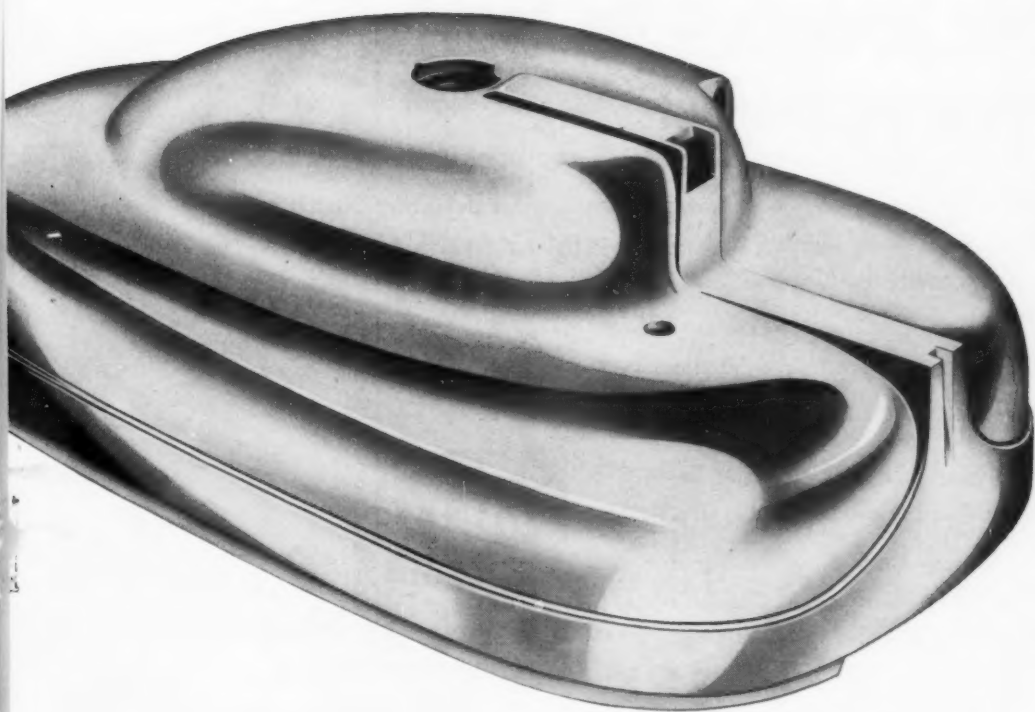
Literally hundreds of time and money saving ideas.
SEND FOR YOUR COPY

FREDERICK

GUMM

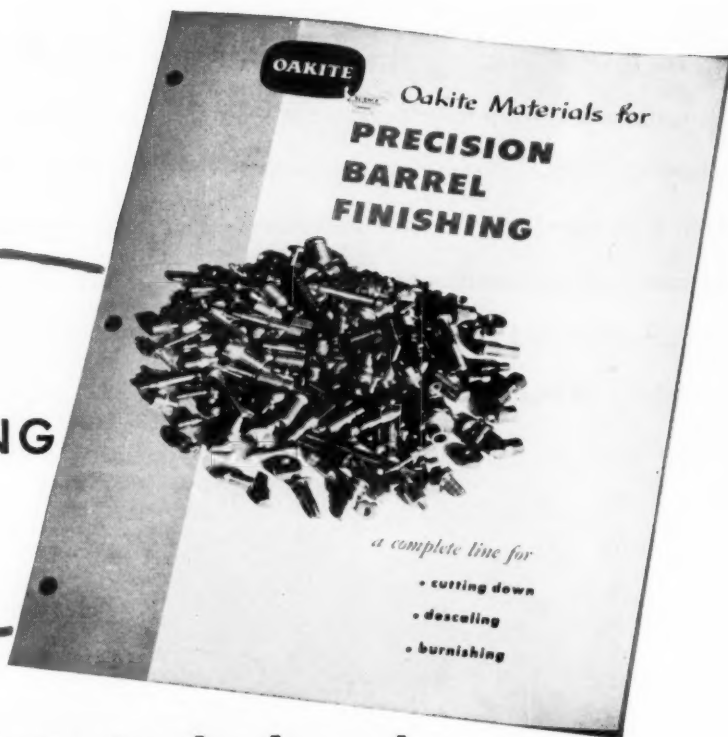
Chemical Company Inc.
538 FOREST STREET, KEARNY, N. J.

How to make plating upon aluminum an exact science: For many years, hundreds of manufacturers have been using Alumon,[®] an Enthone process, to prepare aluminum alloys for electroplating. Enthone chemists work out the plating cycles, give in-the-plant assistance. Alumon is an easy process to use and it costs less than 1/2¢ per square foot of surface plated! Write for literature about this economical and efficient process. Also find out about Etchalume,[®] Weldal,[®] and other specialized Enthone compounds for finishing aluminum. Enthone, Inc., 442 Elm Street, New Haven 11, Connecticut.



ENTHONE
ENTHONE, INC. IS A SUBSIDIARY OF AMERICAN SMELTING AND REFINING COMPANY

HERE'S
AN EXCITING
GAME



PUT your products in the barrel TAKE your profits out

A great way to save money is to barrel finish metal parts by the hundred instead of manually finishing one part at a time.

Next time a job of grinding, deburring or buffing proves too costly on a wheel, try it in a barrel. The results are often so surprising that barrel finishing becomes an exciting and profitable game.

One Oakite customer changed to barrel methods to deburr curved stainless steel strips that are 14 inches long.

The cost for deburring 20,000 strips was reduced from \$3,000 to \$125.

FREE For a copy of "Precision Barrel Finishing" write to Oakite Products, Inc., 18 Rector St., New York 6, N. Y.



Technical Service Representatives in Principal Cities
of U.S. and Canada
Export Division Cable Address: Oakite

4/Circle on Readers' Service Card



Anniversary
60 YEARS
1898 - 1958

During these years, quality has never been compromised in L'Hommedieu - Reliance Products. The L'Hommedieu policy has always been, and will continue to be, finest materials, workmanship, and fair dealings.

The continued patronage of many firms during these first sixty years is assurance that we have endeavored to serve them well and at all times have endeavored to look out for their best interests.

May these ideals be promulgated in the years to come.

For

DURABILITY - PRODUCTION - ECONOMY - EFFICIENCY

Chas. F. L'Hommedieu & Sons Co.

MANUFACTURERS OF METAL FINISHING EQUIPMENT AND SUPPLIES

GENERAL OFFICE AND FACTORY

4521 OGDEN AVE.

CHICAGO 23, ILL.

Chas. B. Little Co.
Newark, N. J.

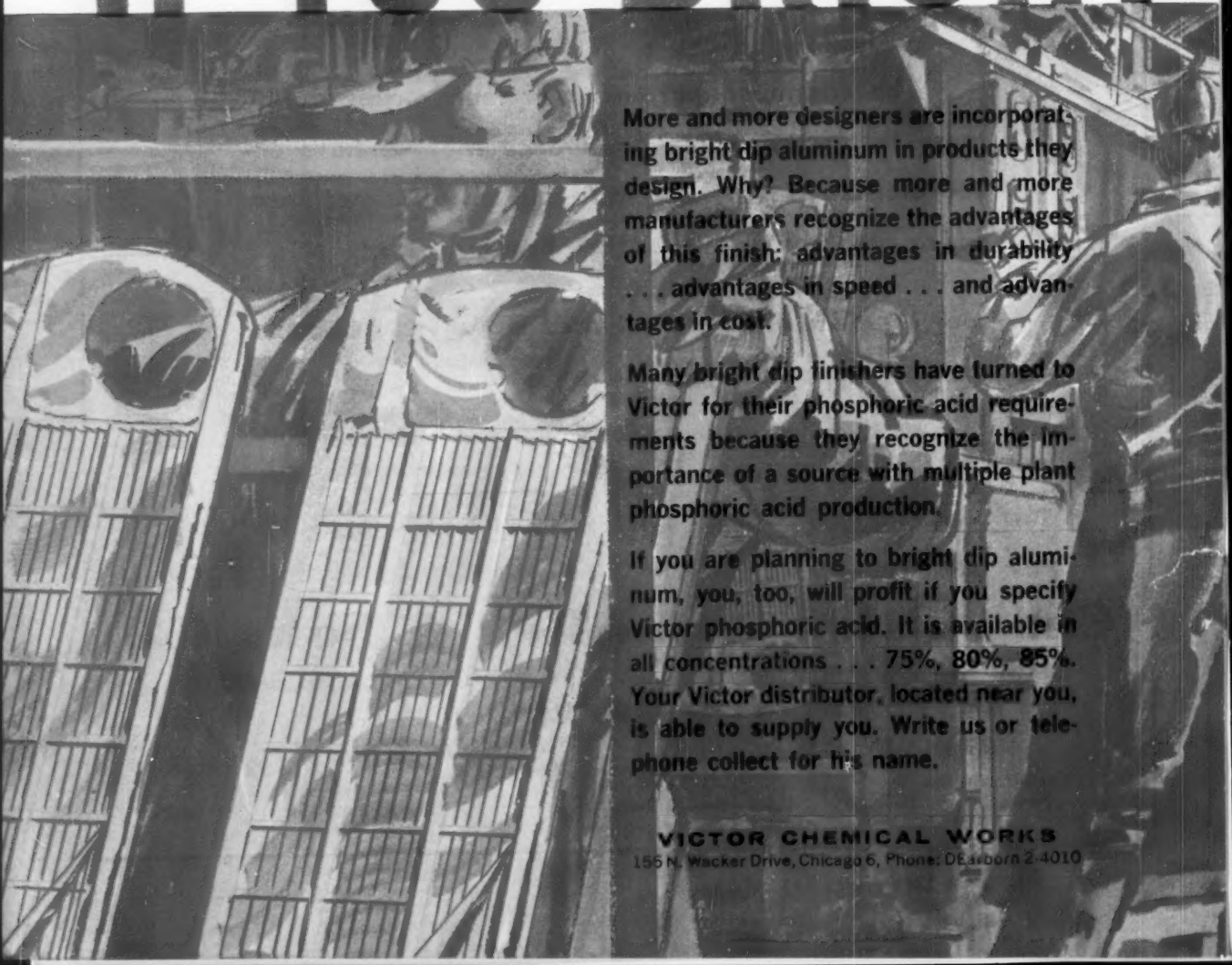
W. R. Shields Co.
Detroit, Mich.

Branches:
Cleveland & Los Angeles



specify
Victor
Phosphoric
Acid

IF YOU BRIGHT



More and more designers are incorporating bright dip aluminum in products they design. Why? Because more and more manufacturers recognize the advantages of this finish: advantages in durability . . . advantages in speed . . . and advantages in cost.

Many bright dip finishers have turned to Victor for their phosphoric acid requirements because they recognize the importance of a source with multiple plant phosphoric acid production.

If you are planning to bright dip aluminum, you, too, will profit if you specify Victor phosphoric acid. It is available in all concentrations . . . 75%, 80%, 85%. Your Victor distributor, located near you, is able to supply you. Write us or telephone collect for his name.

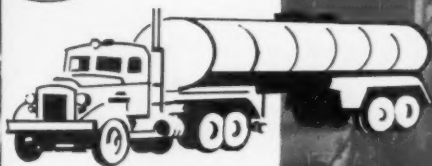
VICTOR CHEMICAL WORKS
155 N. Wacker Drive, Chicago 6, Phone: DEarborn 2-4010

Available now! FREE! Victor's technical service department has just completed a bulletin describing a new, simple method for determining the aluminum concentration in bright dip baths. Write for your copy today. There's no obligation.

30 MINUTE METHOD FOR
DETERMINING ALUMINUM CONTENT



DIP ALUMINUM



Victor phosphoric acid
is available in any
quantity from drums
to tank trucks.



VICTOR

Dependable Name in
Chemicals
for 60 Years

THERE'S ALWAYS A LEADER!



Used Throughout the Plating Industry

Developed and manufactured by experienced platers

MICCROSOL . . .

Today's outstanding heat-cured rack coating that provides positive insulation and protection, amazing tensile strength and scuff resistance, permanent flexibility, and positive, continuous adhesion.

MICCROTAPE . . .

An extruded tape that offers unexcelled protection for plating racks, and for masking parts prior to selective plating.

MICCROTUBE . . .

An extruded tubing especially suited for use on straight or bent contact wires, and for selective plating of simple parts.

MICCRETEx . . .

A synthetic air-dry rack coating for all plating cycles and phosphate coatings—highly resistant to all plating solutions.

MICCROSTOP . . .

For masking of machined parts for all plating cycles. Hairline demarcation . . . extreme accuracy.

MICCROMASK . . .

For masking of machined parts for hard chromium plating. Provides complete protection—assures extreme accuracy.

MICCROPEEL . . .

Specifically designed to supply the need for a stop-off lacquer that can be peeled easily from the part after plating, and will hold a hairline demarcation through all plating cycles.

MICCROLAC . . .

Mirror-finish, water-white lacquer that protects and beautifies the finest of polished or plated metals.

MICCROSTRIP "A" . . .

A blend of the new fast solvents for the quick, easy removal of stop-off lacquers in selective plating.

MICCROLOID . . .

Industrial corrosive-resistant coating for use on all plating equipment, rinse tanks, structural steel, walls, floors, pipe lines, air ducts, etc.

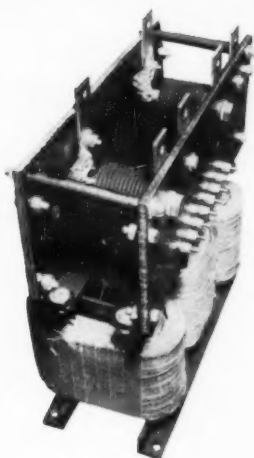
MICCROWAX . . .

Two widely used waxes for selective stop-off, especially suited for masking on complicated parts and sharp edges. C-562 for hard chromium; C-600 for high-temperature cycles.

Samples and descriptive literature of all Micro Products will be sent upon request.

**MICHIGAN CHROME
AND CHEMICAL COMPANY**

8615 Grinnell Avenue, Detroit 13, Michigan

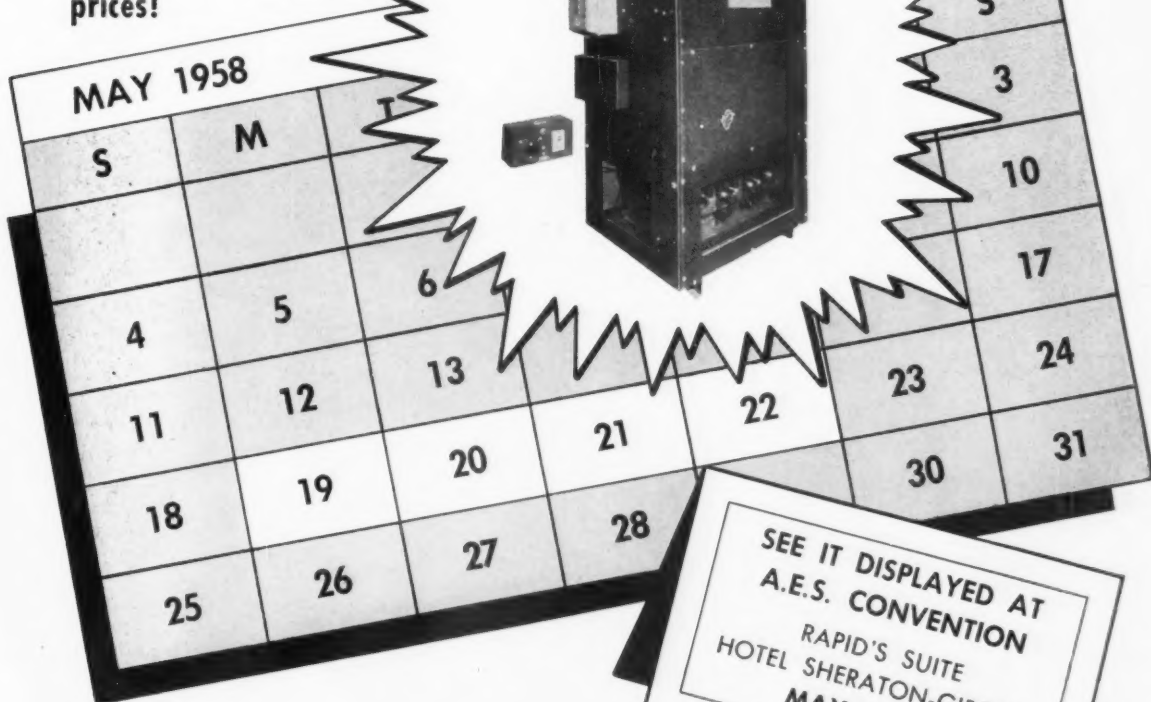


REGAL LINE MAGNETIC AMPLIFIER REGULATED RECTIFIER

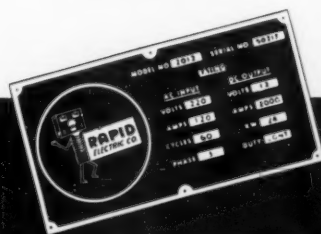
AUTOMATIC VOLTAGE or CURRENT STABILIZATION

At less than
tap-switch
non-regulated
prices!

Rating: 1500 Amp. 10 Volts



SEE IT DISPLAYED AT
A.E.S. CONVENTION
RAPID'S SUITE
HOTEL SHERATON-GIBSON
MAY 19-22



THE NAMEPLATE THAT MEANS *"More Power to You!"*

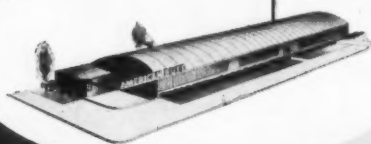
RAPID ELECTRIC COMPANY

12838 Fenkell Avenue • Detroit 27, Mich. • Diamond 1-8537
2881 Middletown Road • New York 61, N. Y. • TAImadge 8-2200

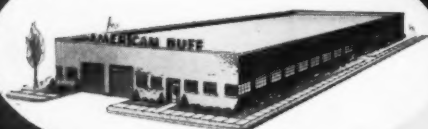
PLANT NO. 1



PLANT NO. 2



PLANT NO. 3

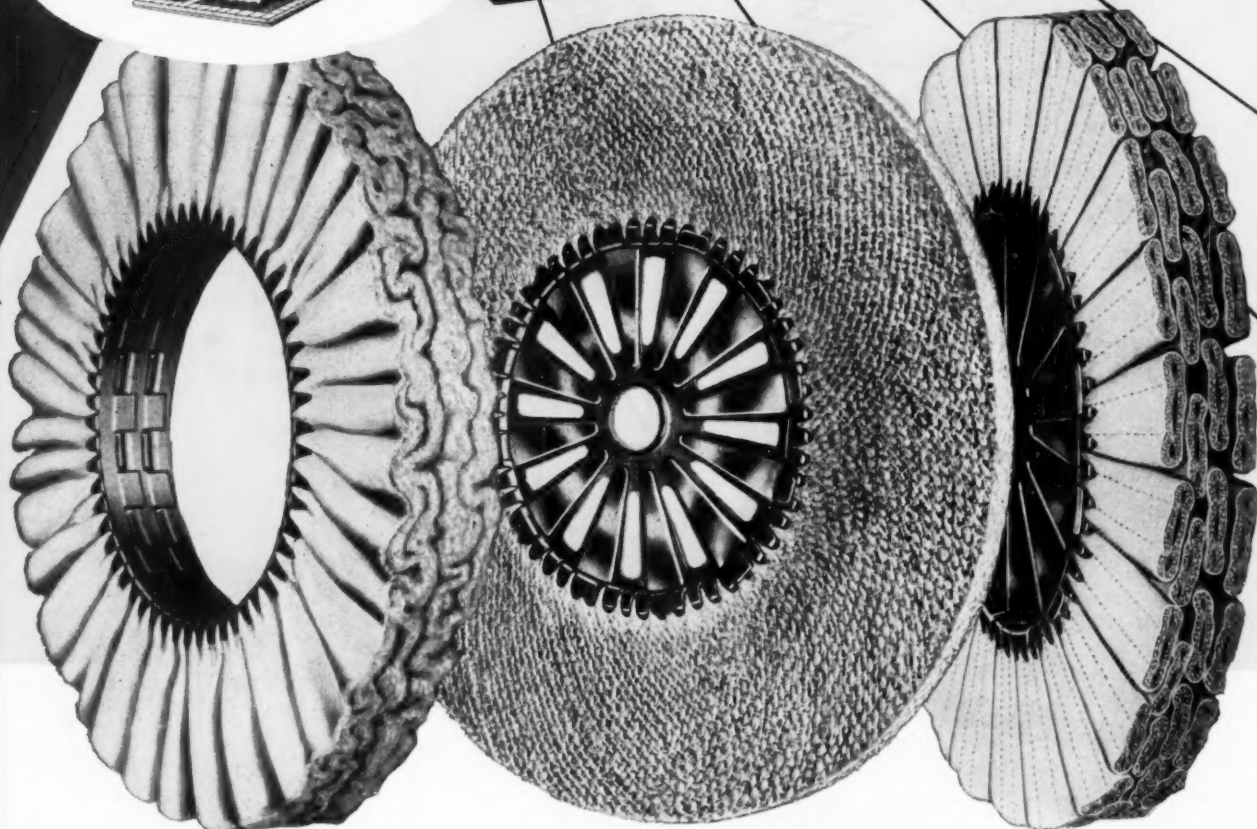


For the

Engineered to do **MORE** buffing Jobs **BETTER!**



From the world's largest buff manufacturing plants come the world's finest buffs! Every American Buff is carefully planned to answer the specific problems of the industry . . . expertly produced of the finest quality materials and workmanship. For variety to meet every need . . . for top performance . . . for outstanding economy . . . choose **AMERICAN** — you can't buy a better buff!



Automatic CENTERLESS **BIAS BUFF**

This versatile buff does both cutting and coloring on a wide variety of metals. Like other American "Automatic" buffs, it features the patented *Centerless* construction with exclusive "Pre-Assembly". Also available with permanent steel or fiberboard centers.

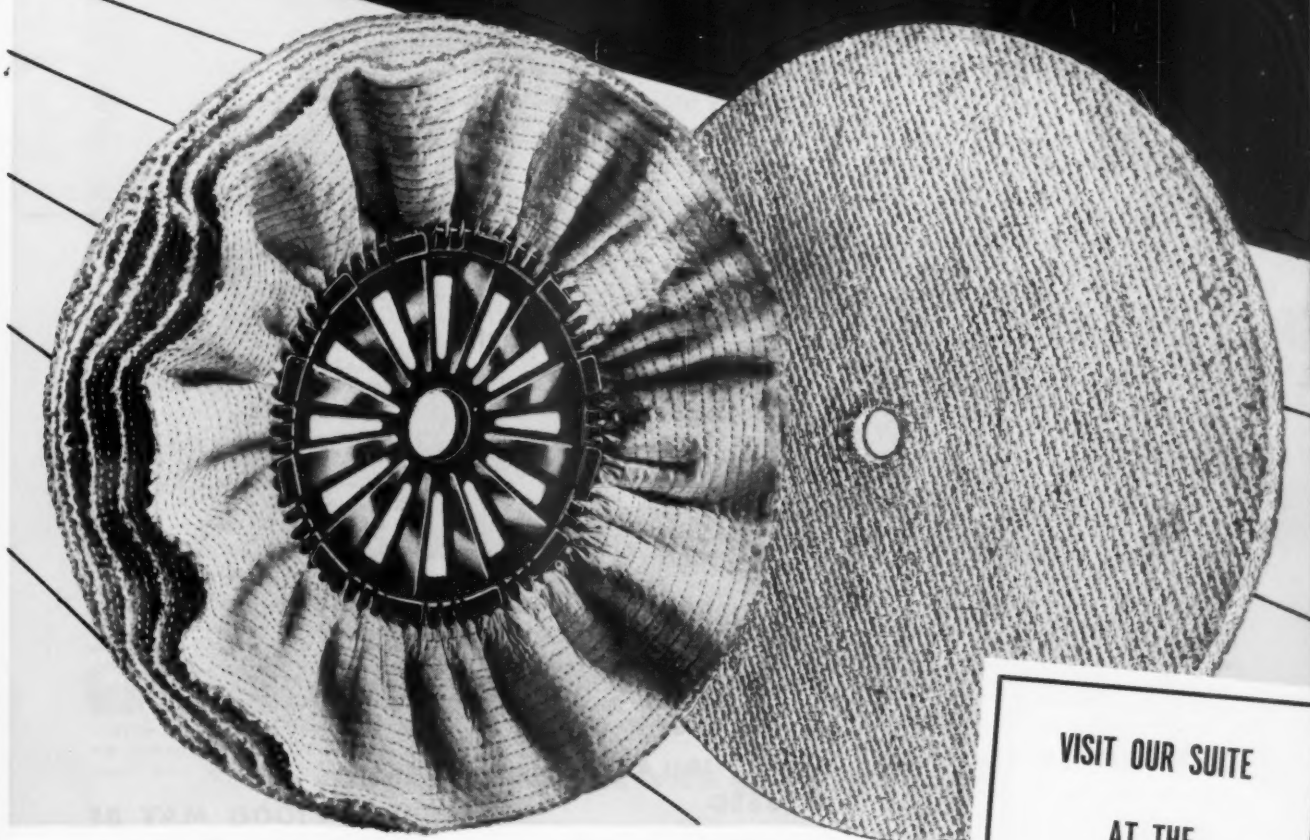
Automatic **BIAS SISAL BUFF**

Top-quality *all-new* sisal gives this buff unmatched durability and fast cutting. Exclusive "permanizing" process actually *locks fibres together* . . . eliminates scratching and fraying. Available in Centerless model or with Permanent Center.

Automatic **UNIT SISAL BUFF**

Extra-flexible for fast cutting and finishing on contoured surfaces. Sisal "units", cloth wrapped to prolong wear, follow every crevice and variation in shape. Air-cooled *unit design* prevents burning or discoloration, even at high speeds. In Centerless or Permanent Center types.

Job that's **TOUGH...** use an **AMERICAN BUFF!**



Automatic **"OPEN" BIAS SISAL BUFF**

Ruffled face eliminates troublesome streaking. New, exclusive "open" design combines the best features of both Bias Cloth and Bias Sisal buffs for fast cutting and high lustre finishing. Made of top-grade "Permanized" sisal, with or without cloth layers—in air-cooled Permanent Center construction.

Licensed under the Bias Sisal Buff Pat. No. 2642706.

Conventional **SISAL BUFFS**

Top-quality "Permanized" sisal, in a variety of constructions: All-Sisal for even finish; Sisal with Cloth for long wear; Sisal with Krinkle-Kraft Paper for extra-sharp cutting; and Custom-Treated Sisal, for harsh or soft cutting to meet your specific needs.

VISIT OUR SUITE
AT THE
SHERATON - GIBSON
HOTEL

AUTOMATIC BUFF COMPANY Division of

American **B**uff **C**ompany

2414 South La Salle Street

• Chicago 16, Illinois

• Telephone: CAlumet 5-1607

Introducing Allied's

IRILACTM #1000

New Clear Protective Coating for All Metals . . . as safe and easy to handle as Water!

New method of protection incorporates corrosion inhibitors in a water-soluble polymer base. Dries to an extremely thin, tough, durable coating—clear in color. Does not chemically affect base metal or any post-treatments. Used as a protective treatment alone or to enhance value of post-treatments.

Allied's new Irilac #1000 is a concentrated solution of a water-soluble polymer with built-in complex corrosion inhibiting materials. It was developed to answer the needs of the metalworking industry for a non-conversion process that will provide corrosion resistance and resistance to fingerprinting and abrasion on base metals and electrochemically or chemically finished surfaces—without changing the appearance of the metallic surface.

There are no hazards involved—Irilac is non-fuming, non-toxic, and requires no special fire prevention measures.

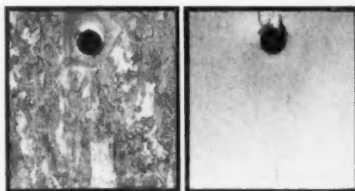
THE PROCESS

Irilac #1000 is diluted with water to provide a simple one-pass working solution. It is then applied by dip, brush or spray and forms a coating that quickly bonds to the metal surface without reacting with the surface.

THE PROPERTIES

The resulting coating is clear, transparent, thin yet durable. It has excellent water-resistant properties, and can be rubbed, handled and subjected to rough treatment. The surface to which Irilac has been applied is not altered—in fact, the transparent coating brings full tone to colored surfaces and clarity to iridescent surfaces. The water-thin physical characteristic of the solution means that the coating provides protection

in recessed areas that are difficult, if not impossible, to protect with other methods.



STEEL PANELS: bare (left) and coated with Irilac (right) after 8-hour salt spray.



ALUMINUM PANELS: bare (left) and coated with Irilac (right) after 168-hour salt spray.

WHERE IRILAC CAN BE USED

Irilac #1000 can be applied to any metal—wet or dry—treated or untreated. All metals can be processed in one operation in the same solution. It can be applied in conjunction with any process—over Iridite, anodized, phosphated surfaces, black oxide, etc. Surfaces treated with Irilac provide a good base for paint.

APPLICATION ADVANTAGES

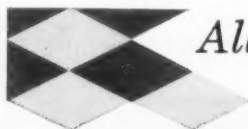
No other process or material available for the protection of metals offers all the application advantages found in new Irilac #1000:

- 1 It can be applied to any clean metal simply by dip, brush or spray. No special equipment is required.
- 2 Saves time—just apply and dry—no reaction time required.
- 3 No hazards involved—no exhaust or special fire protection equipment is required. Irilac is non-fuming and non-toxic.
- 4 Saves space. Presents no disposal problem. Low in first and final costs.

Because of its versatility and complete safety, Irilac has unlimited uses. For example, it will protect aluminum furniture, brass hardware and fixtures, steel parts of all types, zinc castings, etc. In fact, any base metal or plated surface, or those treated with electrolytic or chemical post-treatments, can be improved or enhanced with Irilac.

IRILAC #1000 MAY BE THE ANSWER TO YOUR PROTECTION PROBLEM

Our development staff will be glad to work with you to determine the significant benefits Irilac can offer you. Simply send us some parts and let us show you what Irilac can do. No obligation, of course.

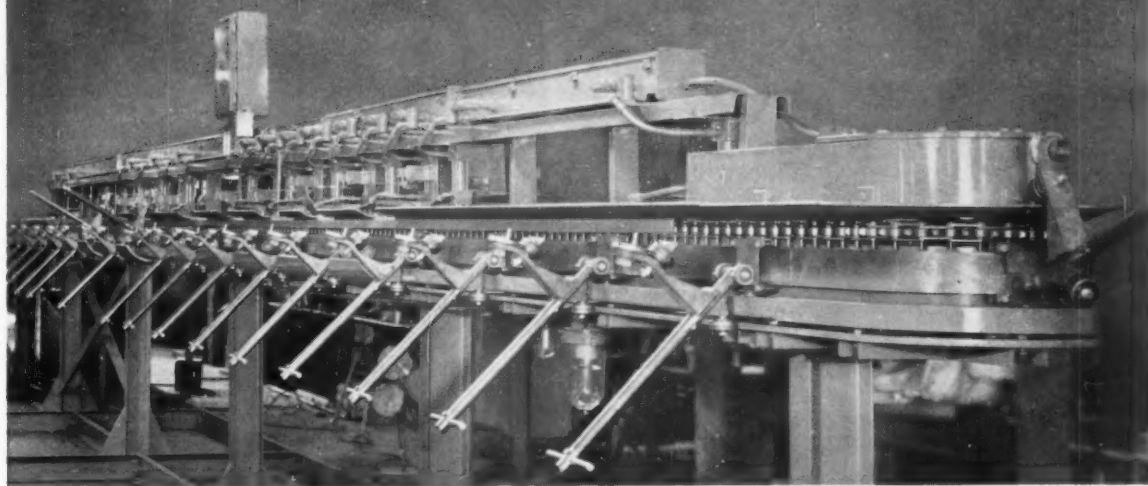


Allied Research Products, Inc.

4004-06 EAST MONUMENT STREET
BALTIMORE 5, MARYLAND

Manufacturers of IRIDITE[®], IRILACTM, ARP[®] Brighteners and Plating Chemicals
West Coast Licensee: L. H. Butcher Co.

**HANDLE 2, 3, OR MORE PROCESS CYCLES
ON ONE MACHINE** *at One Time!*



LASALCO'S *Select-O-Matic*

MULTIPLE PROCESS PLATER

Another Lasalco development that offers the industry the last word in fully automatic plating!

With the new Select-O-Matic, the operator simply selects the desired process cycle for individual racks, when loading the machine, merely by turning a dial on the carrier. From that point, the rack automatically travels through the entire selected cycle without further attention.

A single Select-O-Matic plater, manned by one

operator, will handle several various processes simultaneously. Different machines for each process are eliminated—original investment in equipment is greatly reduced—much less floor space is needed—maintenance is cut to an absolute minimum.

The Select-O-Matic is easily adaptable to any operation. Tell Lasalco about your operation and requirements to learn what this new machine can do for your production and profits.

Write Today!

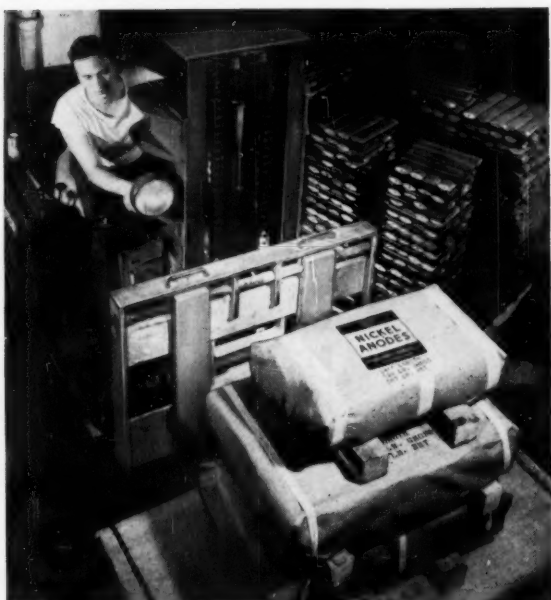
LASALCO, INC.

HOME OFFICE: 2820 LaSalle St. • St. Louis 4, Mo. • PROspect 1-2990
IN TEXAS: 2805 Allen Street • Dallas, Texas • RIVERSide 7-5814

Prompt Delivery of any Quantity

HARSHAW Nickel Anodes

99+%



HARSHAW XXX CAST CARBON NICKEL ANODES are oval $1\frac{1}{2}'' \times 3''$ in cross section and are available in any length desired. Weight is approximately 1.1 lbs. per linear inch. They are normally used in dull, semi bright and bright nickel plating baths where the pH is 4.5 or lower.

HARSHAW ROLLED OVAL CARBONIZED NICKEL ANODES are $1\frac{1}{4}'' \times 3''$ in cross section and are available in any length desired. Weight is approximately 1 lb. per linear inch. They are generally used in dull, semi bright and bright nickel plating baths where the pH is 4.5 or lower.

HARSHAW ROLLED OVAL DEPOLARIZED NICKEL ANODES have the same cross section and weight as the rolled oval carbonized nickel anode and are also available in any length desired. These anodes are generally used in nickel plating baths where the

pH is 4.0 or higher; they are extremely suitable for such use, as they will corrode well over a wide range of operating conditions.

PACKAGES

Harshaw anodes are wrapped in a fibre reinforced laminated (without asphalt) paper. They are protected from tramp oils, dirt and grease and remain clean until used. The possibility of such contaminants being introduced into the plating solution from anodes is thus kept to a minimum.

Harshaw anodes are shipped in compact packages which feature built-in skids and facilitate quick handling by mechanical or hand trucks. The packages stack easily and quickly. Also, no deposits or returnables are involved with this type of packaging.

Harshaw Nickel Anodes are readily available and prompt shipment of any quantity will be made upon receipt of your order.

Recasting Service

Our foundry facilities are available for recasting nickel anode scrap. Contact your nearest Harshaw Branch for further details.



THE HARSHAW CHEMICAL COMPANY

1945 E. 97th Street • Cleveland 6, Ohio

CHICAGO, ILLINOIS • CINCINNATI, OHIO • CLEVELAND, OHIO
DETROIT, MICH. • HOUSTON, TEXAS • LOS ANGELES, CALIF.
HASTINGS-ON-HUDSON, N. Y. • PHILADELPHIA, PENNSYLVANIA
PITTSBURGH, PENNSYLVANIA

Harshaw

PERFLOW PERGLOW

DUPLEX Nickel Plating Process

The FIRST accepted by the plating industry.

Over 500,000 gallons in successful operation for more than 3 years.

After ten years of research and development, and more than 3 years of production experience, The Harshaw Chemical Company offers a new nickel process answering a major problem of the electroplating industry. You can now deposit *economically* a nickel coating that has high leveling, full brightness, excellent ductility, and most important, superior corrosion resistance. *Only the Harshaw Perflow-Perglow Duplex Nickel Plating Process can provide all of the above characteristics.*

Excellent Corrosion Protection Through Use of a Sulfur-Free Deposit

Years of research work performed by The Harshaw Chemical Company revealed that for satisfactory corrosion resistance the nickel deposit must be *sulfur free*. This fact led to the development of the Perflow nickel plating process. Further research revealed that the utilization of the sulfur-free deposit as a base coating, following by a bright nickel from a compatible bath, would further improve corrosion resistance. Performance data from a number of leading car manufacturers indicate that the Harshaw Perflow-Perglow Duplex nickel plate is comparable to, and frequently better than, buffed grey nickel, and is unequalled by any bright nickel.

Exceptionally High Plating Speeds

With air agitation, high current densities can be employed, resulting in exceptionally high plating speeds.

Excellent Chrome Coverage

The Harshaw Perflow-Perglow Duplex Nickel Plate is easily chrome plated with no unusual treatment of the nickel necessary even over extended periods of time.

Excellent Leveling

The Perflow-Perglow Duplex Nickel has excellent leveling characteristics which aid in producing bright deposits on poorly polished steel or over dull copper plate. The leveling characteristics can be maintained without sacrificing ductility, brightness, and corrosion resistance.

Outstanding Brightness

Full, bright deposits over a wide range of operating conditions. Even intricate deeply-recessed articles have uniform brightness without shading.

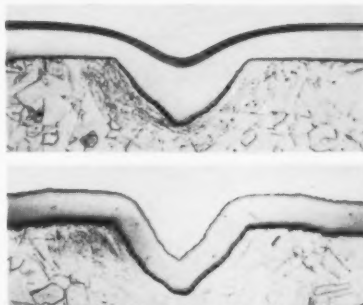
High Tolerance to Impurities

The Perflow-Perglow process has a high tolerance to impurities from the standpoint of both corrosion resistance and overall quality of plate.

Excellent Adhesion

Plating nickel over nickel is no longer a problem. Current can be interrupted without affecting the adhesion. Work can be removed from the plating solution for inspection and put back in the bath without affecting adhesion.

Excellent Ductility at Full Brightness!
The ductility of the Perflow-Perglow



The above photomicrographs demonstrate the leveling effect of Harshaw Duplex Nickel as compared to that of conventional grey nickel.

Top: Perflow-Perglow Duplex Nickel—depth of scratch 2.7 mils.

Bottom: Grey nickel—depth of scratch 2.7 mils.

Duplex Plate is comparable to that of a plate from a Watts nickel bath.

MANY OTHER ADVANTAGES!

simplified control . . . stable over extended periods of operation . . . controlled stress . . . uniform protective and decorative plate on both steel and zinc die castings.

HARSHAW'S RESEARCH AND DEVELOPMENT LABORATORY

SOLVED THE PROBLEM OF PLATING NICKEL ON NICKEL.

THIS COUPLED WITH THE USE OF A SULFUR-FREE

NICKEL PLATE HAS MADE POSSIBLE A CORROSION

RESISTANT DEPOSIT THAT IS UNEQUALED.



THE HARSHAW CHEMICAL COMPANY

General Offices and Research Laboratories • 1945 EAST 97th ST. • CLEVELAND 6, OHIO

Sales Branches
and Warehouses

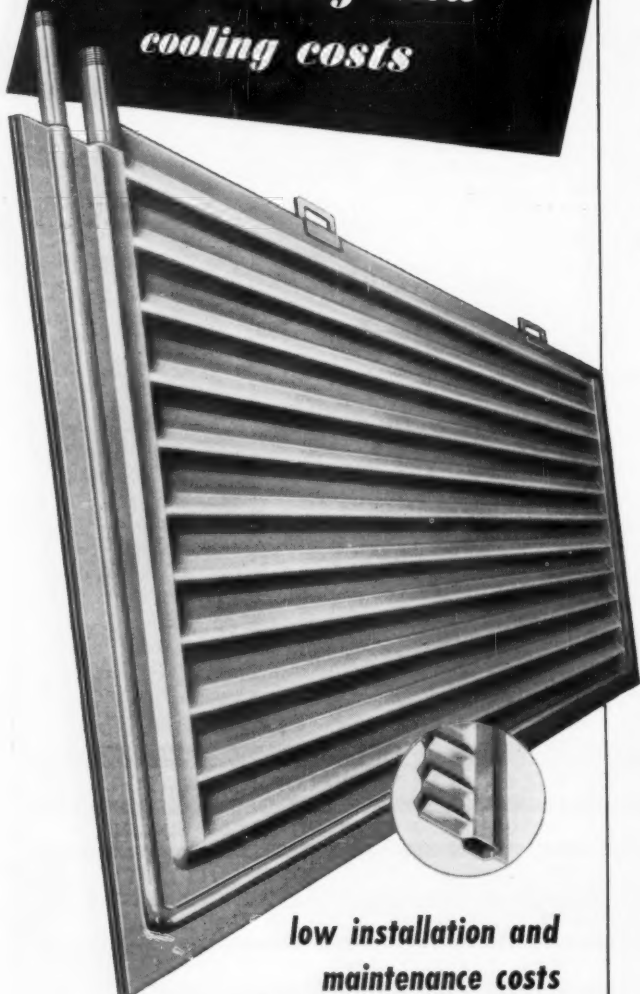
CHICAGO
CINCINNATI
CLEVELAND

DETROIT
HOUSTON
LOS ANGELES

HASTINGS-ON-HUDSON, N. Y.
PHILADELPHIA
PITTSBURGH

pipe coils are old fashioned...

modern
PLATECOIL®
*cuts heating and
cooling costs*



**low installation and
maintenance costs
greater heat transfer efficiency
lower space requirements**



Write for free Bulletin P-52 "HOW TO CUT
HEAT TRANSFER COSTS WITH PLATECOIL"
for complete information.

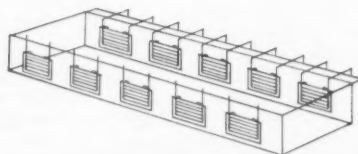
KAWNEER uses

stainless steel PLATECOIL®

units in acid anodizing tanks

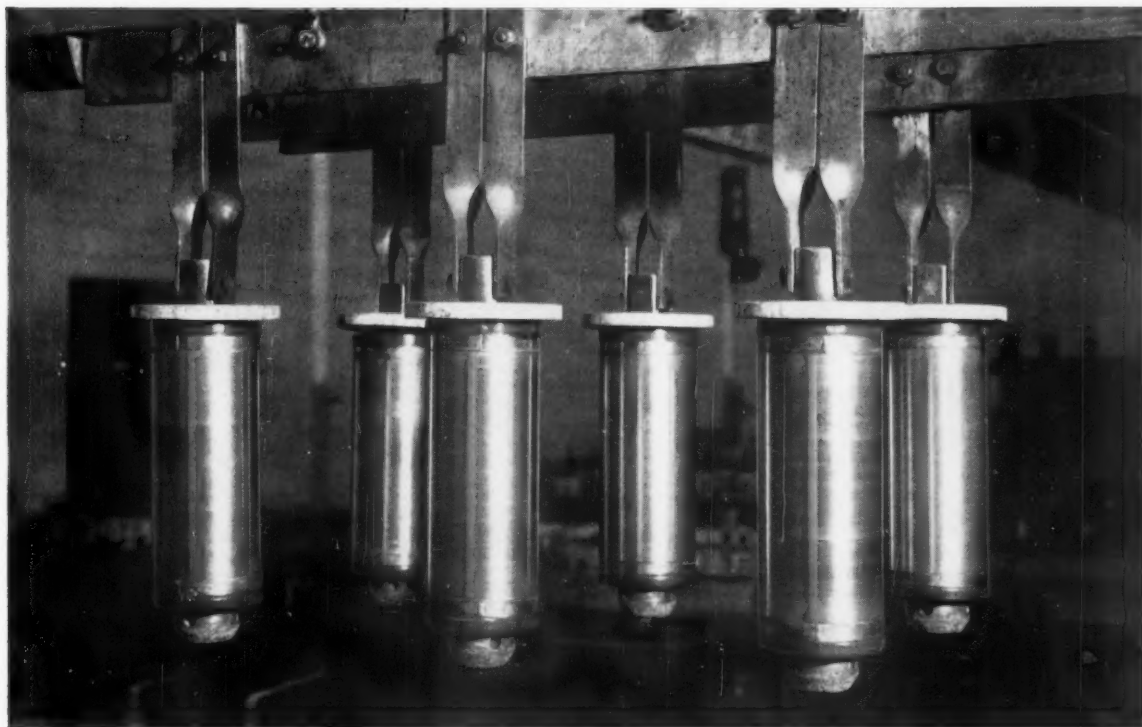
Ease of changing, cleaning and repair are among the advantages of PLATECOIL over pipe coils cited by the KAWNEER CO. Architectural Products Division at Niles, Michigan. Low installation costs, good maintenance and space savings over pipe coils plus heat transfer efficiency are advantages which this company has obtained by using PLATECOIL. The PLATECOIL units are used for heating in water seal, caustic and cleaner tanks; for cooling in anodize tanks.

The drawing and photo show the location of the PLATECOIL units in an acid anodizing tank with PLATECOIL connections which can be broken above the surface of the solution for easy maintenance.



TRANTRER MANUFACTURING INC.
LANSING 9, MICHIGAN

PLATECOIL®
DIVISION



These six arbors of piston rings have just emerged from a chrome plating bath at the Koppers Company's Baltimore

plant. Consistently low sulfate content of Mutual Chromic Acid helps insure flawless finish on critical parts like these.

To insure a uniform, flawless chrome finish use **MUTUAL ^{LOW}SULFATE CHROMIC ACID**

When chrome plating must be perfect — when anything less means a profit-eating reject — you can rely on Mutual Chromic Acid to reinforce your technical skill.

Mutual Chromic Acid is always 99.75% pure — or better. Sulfate content never exceeds 0.1%. This consistently low sulfate content of Mutual Chromic Acid makes it easy for you to control

the acid-sulfate ratio of your plating bath. It is your insurance against plating difficulties.

Send today for the free Mutual booklet, "Chromium Chemicals," which contains useful technical information about the entire line of Mutual chromium chemicals. A Technical Service Staff is also available, to offer help or information at any time.

Mutual Chromium Chemicals



Sodium Bichromate
Sodium Chromate
Chromic Acid

Potassium Bichromate
Potassium Chromate
Ammonium Bichromate

Korson (One-Bath Chrome Tan)

MUTUAL CHROMIUM CHEMICALS
SOLVAY PROCESS DIVISION
Allied Chemical & Dye Corporation
61 Broadway, New York 6, N. Y.



Please send me Bulletin #52—Chromium Chemicals—
Their History, Properties and Uses.

NAME _____ POSITION _____

COMPANY _____

STREET _____

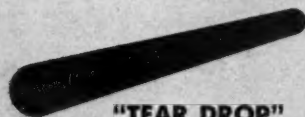
CITY _____ ZONE _____ STATE _____

DEPT. 9

NEW SHAPED, EXTRUDED APW SILVER ANODES



"RECTANGULAR"



"TEAR DROP"



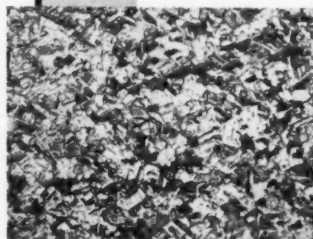
"DOG BONE"

STANDARD
SHAPES



ROLLED FLAT PLATE
ANODE SECTION:

This Photomicrograph shows highly irregular, uncontrolled grain size—a major cause of shedding and resultant rough electrodeposits.



APW EXTRUDED
ANODE SECTION:

Small, fully controlled regularity of grain size promotes uniform corrosion, smoothest electrodeposits, less rejects.

CONTROLLED GRAIN SIZE: APW EXTRUSION PROCESS*

controls grain size within definite limits — minimizes sheddings

These scientifically shaped anodes retain 80% of original active surface area after 85% by weight has been plated off!

Costs are lowered by prolonged anode life, minimized polarization and less silver scrap to be refined.

In addition, the APW Extrusion Process controls grain size within definite ideal limits so that corrosion is smooth and uniform. Electrodeposits are *consistently* smooth. Shedding is virtually eliminated. Rejects are a comparative rarity!

We are anxious that the silver you buy in anodes is used most efficiently and economically. Special anode shapes will be engineered to meet your particular plating bath conditions. Call or write for a representative. We'll be glad to assist with your plating problems.

*Pat. Pending

ENGELHARD INDUSTRIES, INC.

AMERICAN PLATINUM & SILVER DIVISION

231 NEW JERSEY RAILROAD AVE. • NEWARK 5, N. J.

NEW YORK • PROVIDENCE • CHICAGO • SAN FRANCISCO • LOS ANGELES



For Aluminum

WHEREVER COLOR FINDS
NEW USE in contemporary or
traditional design, CIBA pro-
vides a unique creative
knowledge and practical dye
experience to assist the de-
signer and producer achieve
the finest color results.

THE OXANAL® DYES OF
CIBA for aluminum dyeing are
outstanding for the fast, eye-
appeal color with dependable
dyeing properties they pro-
vide across an exceptionally
wide range of shade effects.

Because they make color in-
tegrally a part of anything
made of aluminum, the color-
ful new look OXANAL dyes
design into structures, appli-
ances, and many other uses,
indoors or out, will last for a
lifetime with minimum main-
tenance. For full information
on these unique OXANAL
Colors developed out of three
quarters of a century of world-
renowned CIBA dye-making
experience, address...

C I B A

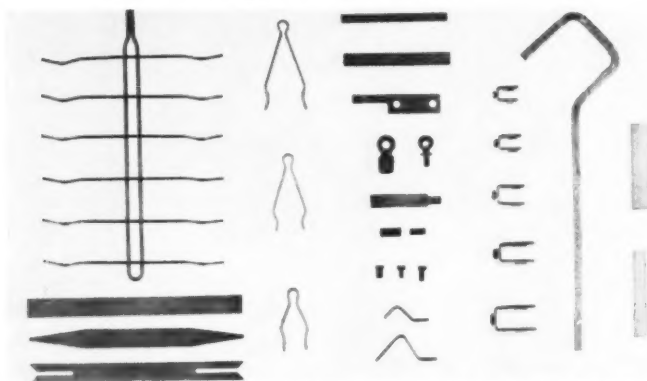
CIBA Company Inc.
627 Greenwich Street.
New York 14, N. Y.

Oxanal Fast Dyes



We're **PROUD**
 To Celebrate Our
25TH Year
 Serving Platers
 And We're Thankful
 for
 Your Support!

**NEW! 1958 COMPONENTS FOR
 ERECT - A - RACK**
 For Plating, Anodizing, Painting



"Put Them All Together, They Spell PROFIT!"

A wrench is all you need to quickly assemble racks for almost any job. You cut rack preparation time to a fraction, need no bulky equipment. There's no bending, no forming, no holes to drill, no mistakes that can't be rectified in seconds. There IS convenience, ease of operation and, above all, more margin for profit when you use ERECT-A-RACK!



It's a must for
 patching after
 making a tip
 replacement . .

Injured Areas
 Are Mended to
 Perfection With
 Just a Squeeze
 of the Tube . . .

**OUR
 25th
 YEAR**

STANDARD
PLATING RACK COMPANY

1913-25 N. Paulina St.

Chicago 22, Ill.

**OUR
 25th
 YEAR**

HANDY GUIDE TO CHROMATE DIPS



Line of Unichrome Dips offers unusually wide choice

...permits proper matching of solution with product and production needs

Conversion coatings for metals are formed integral with the surface, and improve a product's appearance and corrosion resistance at surprisingly low cost. No single chromate solution satisfies all conversion coating needs. This chart shows what you can get. It is a partial listing covering chemical conversion coatings for zinc. There are still other Unichrome chromating compounds for cadmium and other metals.

In addition, Metal & Thermit offers its long experience in plating and finishing processes, through its highly qualified service engineers. Send for complete Unichrome Pick-A-Dip Chart.



METAL & THERMIT CORPORATION

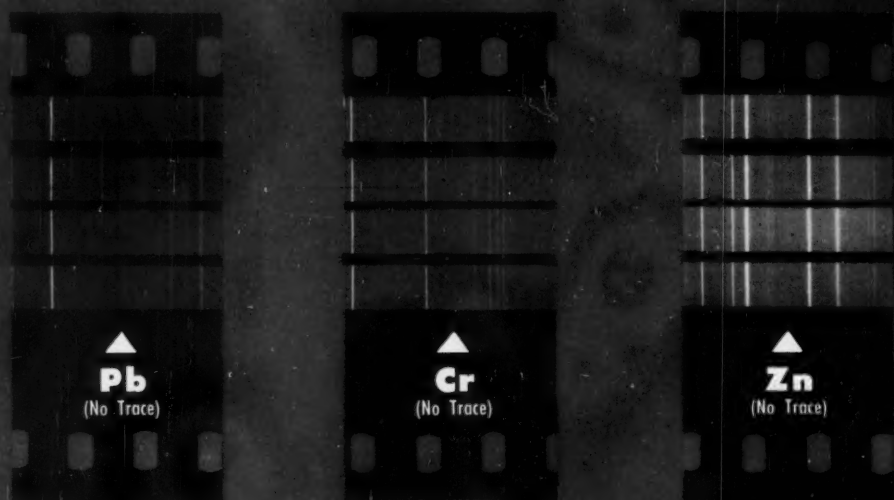
GENERAL OFFICES: RAHWAY, NEW JERSEY

Pittsburgh • Atlanta • Detroit • E. Chicago • Los Angeles

In Canada: Metal & Thermit—United Chromium of Canada, Limited, Rexdale, Ont.

METAL SURFACES	COLOR AND PROPERTIES OF FINISH	UNICHROME DIP COMPOUND	METHOD OF APPLICATION	SALT SPRAY RESISTANCE (TO WHITE CORROSION)	MEETS U.S. GOV'T. SPECS	TYPICAL APPLICATIONS
Zinc Plate or Galvanized	Bright, chromium-like finish, high corrosion protection, resistant to finger printing, tarnish, stain.	95 (liquid) or 1081 (solid)	Manual dipping & alkaline leach	50 hours or more	USA 57-0-2C Type I	Toys, appliance, aircraft & bicycle parts, tools, wire goods, quality hardware.
	Bright, chromium-like finish, maximum clarity, high eye-appeal, good corrosion protection.	98 (liquid) or 1082 (solid)	Manual or automatic; alkaline leach; (98 permits hot water leach)	50 hours or more	USA 57-0-2C Type I	Toys, appliance, aircraft & bicycle parts, tools, wire goods, quality hardware.
	Bright, chromium-like finish, highly economical, good eye-appeal, good corrosion protection.	99 (liquid) or 1084 (solid)	Manual or automatic; alkaline leach	50 hours or more	USA 57-0-2C Type I	Toys, appliance, aircraft & bicycle parts, tools, wire goods, quality hardware.
	Bright, clear finish, maximum economy.	1090 (liquid) or 1085 (solid)	Manual or automatic; no leach	10 to 50 hours	None applicable	High tonnage bulk work, automotive, electrical.
	Iridescent yellow finish, excellent paint base at low cost, maximum corrosion protection.	95 (liquid) or 1081 (solid)	Manual or automatic; no leach	More than 100 hours	USA 57-0-2C Type I QQZ-325 Type II QQP-416 Type II	Appliance & business machine parts, conduits, lock hardware.
	Dark, iridescent yellow finish, maximum corrosion protection, excellent low-cost paint base.	1071 (liquid) & 1071A (liquid)	Manual or automatic; no leach	More than 100 hours	USA 57-0-2C Type I QQZ-325 Type II QQP-416 Type II	Hardware, marine, appliance parts.
Zinc Plate	Bright, brass-like finish, maximum corrosion protection. Usually coated with clear lacquer.	1075 (liquid)	Manual or automatic; no leach	More than 100 hours	USA 57-0-2C Type I QQZ-325 Type II QQP-416 Type II	Hardware, wire goods, wheel goods, toys.
	Olive drab finish, maximum corrosion protection.	1071 (liquid) & 1071A (liquid)	Manual or automatic; no leach	More than 100 hours	USA 57-0-2C Type I QQZ-325 Type II QQP-416 Type II	Hardware, ordnance & communication items.
	Jet Black, glossy or matte finish, maximum corrosion protection.	1060, 1060A, & 1061 (liquids)	Manual or automatic; no leach	More than 100 hours	USA 57-0-2C Type I	Zippers, hardware, toys, communications.
Zinc Die Castings	Iridescent yellow finish, maximum economy, maximum corrosion protection, excellent paint base.	95 (liquid) or 1081 (solid)	Manual or automatic; no leach	More than 100 hours	QQZ-325 Type II QQP-416 Type II	Fuel pumps, carburetors, housings, hardware.
	Dark, iridescent yellow finish, maximum corrosion protection.	1071 (liquid) & 1071A (liquid)	Manual or automatic; no leach	More than 100 hours	QQZ-325 Type II QQP-416 Type II	Fuel pumps, carburetors, housings, hardware.
	Dark brown finish, maximum corrosion protection.	1075 (liquid)	Manual or automatic; no leach	More than 100 hours	QQZ-325 Type II QQP-416 Type II	Fuel pumps, carburetors, housings, hardware.
	Black finish.	1060, 1060A, & 1062 (liquids)	Manual or automatic; no leach	More than 100 hours	None applicable	Zippers, toys, hardware.

COPPER CYANIDE



Spectrographic Analysis PROVES CP's Copper Cyanide CONSISTENTLY Free From Impurities

Whenever you use CP's Copper Cyanide you can be *sure* of its purity and dependability . . . because every batch is carefully tested.

The photographs above illustrate the absence of any trace of lead, zinc or chromium. This film record is typical. In addition, our Copper Cyanide is completely free of sulphur or organic contamination. In tests run on production samples over an 18 month period, no deviation in purity was noted. The quality of all our products is constantly checked both by spectrographic analysis and un-

der actual working conditions. Our own findings are confirmed by tests on a typical production sample by an independent laboratory, Ledoux & Company.

As domestic producers, we offer reliability of source, through conveniently located distributors.

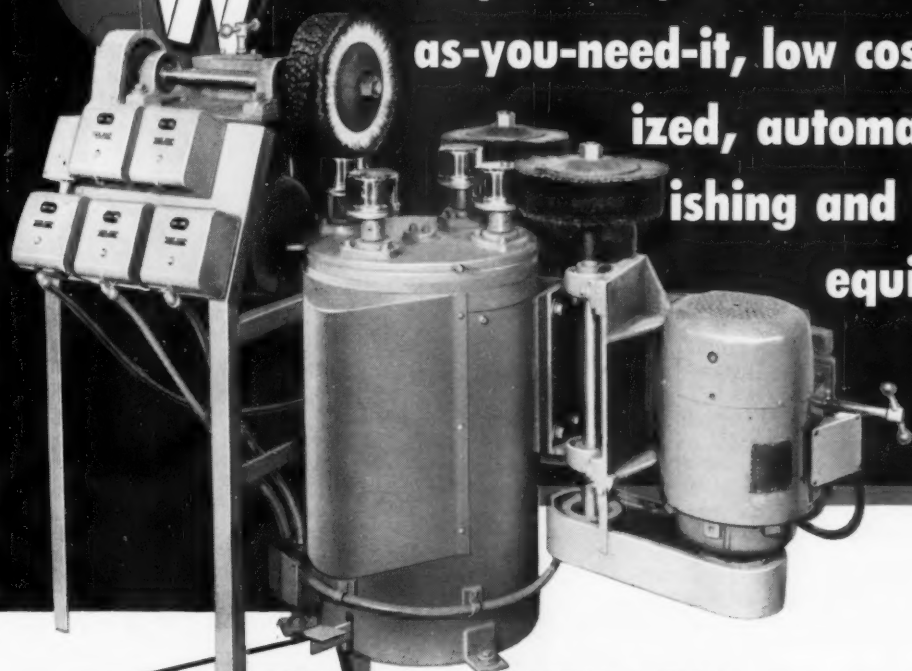
Investigate the advantages of CP's Copper Cyanide. We will be happy to send you a copy of the Ledoux & Company Analysis Report and a sample for your own testing, without obligation of course.



**COPPER PIGMENT & CHEMICAL
WORKS, INC.**

217 BAYWAY, ELIZABETH 2, NEW JERSEY

MURRAY WAY



**IT PAYS FOR
ITSELF!**

Murray-Way's years of specialized experience in automatic polishing and buffing equipment are at your service. The Junior Automatic is only one item in our line of standardized equipment for specialized applications. We invite your inquiries and special equipment problems.

Write today for detailed literature and prices.

announces...
a practical, new idea in add-
as-you-need-it, low cost, unit-
ized, automatic pol-
ishing and buffing
equipment!

- LOW CAPITAL OUTLAY.
- EXPANDS INEXPENSIVELY TO YOUR NEEDS.
- DOUBLES OR TRIPLES PRODUCTION.
- IMPROVES QUALITY—CUTS COST.
- REQUIRES ONLY 6' x 8' FLOOR AREA.
- ADJUSTABLE, AUTOMATIC OPERATION.

A small automatic with "big" abilities. The Murray-Way Junior Automatic is designed to economically handle a few pieces or a large production. It's ideal for big or small plants.

Available with basic equipment at a fraction of the cost of conventional automatic or semi-automatic buffing and polishing machines, the Junior Automatic can be equipped with standardized additional units, as-you-need-it, to handle practically any job in the place.

Adjustable heads available with vertical, horizontal and angle wheels or abrasive belts. Adjustable cycle and dwell. Automatic wheel lift-off and other features usually available only on bulky, expensive automatics.

MURRAY WAY

CORPORATION

P. O. BOX 110, MAPLE ROAD E. • BIRMINGHAM, MICH.

Of course you can titrate NIALK® TRICHLOR but you never have to

psp is why • The reason you take the time and the trouble to titrate your degreasing solvent is to make sure its stabilizer is still active.

Users of Nialk trichlorethylene find six good reasons why they never *have to* titrate. All six add up to *psp*—permanent staying power.

psp means neutral The neutral Nialk stabilizer cannot react with acids to form corrosive salts. Yet it will "accept" acids and render them neutral and harmless.

psp means insoluble in water You never lose the Nialk stabilizer during steam distillation or in the water separator of your degreaser.

psp means full protection The Nialk stabilizer has the same boiling point as the solvent, so you get complete recovery during distillation and full protection in your degreaser's vapor phase.

psp means no staining or discoloration of parts There are never compounds present which can cause staining or deposit formation on the metals you degrease.

psp means clean bath and coils Nialk trichlor eliminates those deposits on coils which cut down heat transfer. Nialk baths have gone for long periods of time without coil cleaning.

psp works with all metals Even white metals are degreased safely with Nialk. Chlorides of these metals, which might be formed under unusually severe conditions, are rendered harmless by the Nialk stabilizer.

Hooker Bulletin 70 gives a complete study of stabilizers. Bulletin 72 offers a standard titration method for Nialk trichlorethylene. Send the coupon for either.

Please send: ☐ Bulletin 70, Advantages of Nialk Neutrally Stabilized Trichlorethylene ☐ Bulletin 72, Acid Acceptance Test for Trichlorethylene.

Name

Title

Company

Street

City Zone State

HOOKER

ELECTROCHEMICAL COMPANY

1305 UNION STREET, NIAGARA FALLS, N. Y.

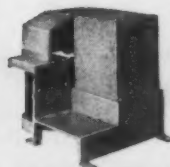
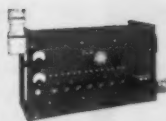
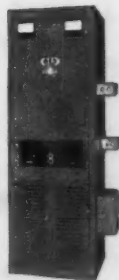
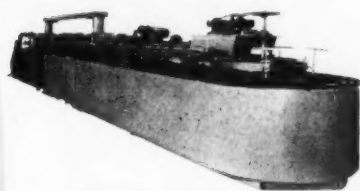
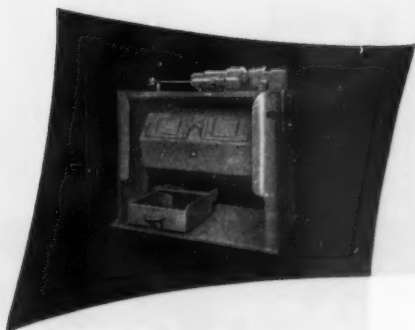
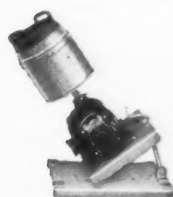
Sales Offices: Chicago Los Angeles New York Niagara Falls
Philadelphia Tacoma Worcester, Mass.

In Canada: Hooker Chemicals Limited, North Vancouver, B. C.

HOOKER
CHEMICALS
PLASTICS

If you have to titrate your degreasing solvent often because it contains stabilizers which wear out, it's time you took a look at Nialk TRICHLORethylene with *psp*.





CROWN equipment

Automatic Machines for Plating-Anodizing, etc.

Dryers, Centrifugal

Partially Automatic Plating Machines

Plating Barrels

Rectifiers

Rheostats, Switches — Controls

Tray — Transfer Type Cleaning — Rinsing —
Dipping Units

Tumbling Barrels — "Horizontal" — "Tilting"

Special equipment designed and built

COMPLETE DETAILS SENT PROMPTLY ON REQUEST

CROWN RHEOSTAT AND SUPPLY COMPANY

3465 N. KIMBALL AVENUE • CHICAGO 18, ILLINOIS

remove **RUST** **SCALE** and **SMUT**

FROM FERROUS METALS

with fast-acting
AHCO Compounds

Whatever your removal problem, it will pay you to check Ahco's complete line of tested and proven compounds. Included are both acid and alkaline materials for soak tank, electrolytic tank, and tumbling operations. Three of the most popular are...

AHCO Deruster No. 11-E

A non-ferrous alkaline compound for use in tumbling barrels, Ahco Deruster No. 11-E produces a clean bright surface.

AHCO Deruster No. 11

A powerful, non-toxic alkaline compound, Ahco Deruster No. 11 will not attack ferrous base metal. It's ideal in electrolytic soak tanks.

AHCO Descaler A

A new, economical dry acid material, AHCO Descaler A is ideal for use in many acid dipping operations.

FREE bulletins describing these and many more AHCO Compounds are now available . . . write for your copies to



APOTHECARIES HALL CO.

DIVISION OF

THE HUBBARD-HALL CHEMICAL CO.

WATERBURY, CONN.

**"THIS UDYLTE TEMPRON CYLINDER HAS
PLATED OVER ONE MILLION POUNDS**



... AND IT'S READY FOR MILLIONS MORE!"

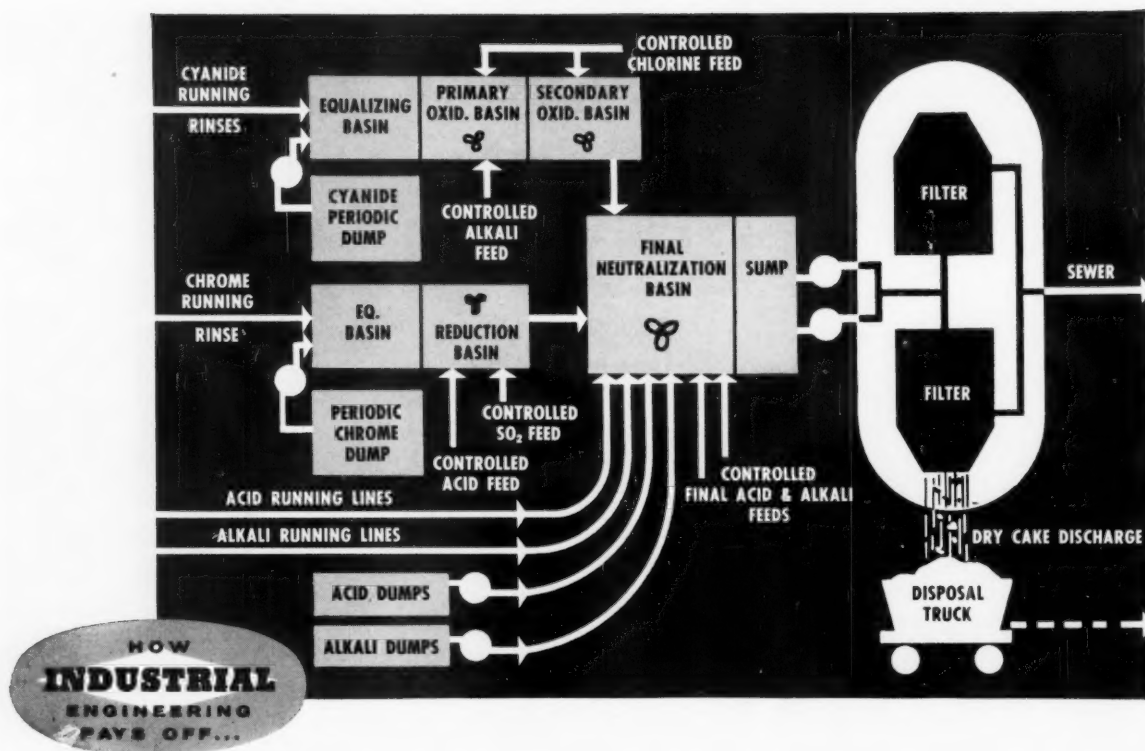
says Al Betteley, Bellevue Plating, Detroit, Michigan

"We have discovered," continues Mr. Betteley, "that because of their rugged construction and amazing heat and abrasion qualities, these plating cylinders are the most economical and desirable we have ever used. We process up to 200 pounds of work in 14" x 30" cylinders at temperatures up to 212°F. with no damage or softening. Then, contrasting this, we immediately rinse them in cold water. Their ability to withstand these terrific temperature variances allows for greater production and the unique design makes maintenance a very simple task. In short, we're satisfied with Udylte Tempron cylinders. They give us more for our money!"

Like so many other platers, Bellevue Plating has discovered the advantages Udylte Tempron construction has to offer. If you desire full production with a minimum of maintenance, you'd better make the discovery, too. Your local Udylte representative has the full story of how they can benefit you and your plating operation. Call him today, or write direct to:



detroit 11, michigan • world's largest plating supplier



EXAMPLE:

Cutting Costs on Plating Waste Disposal

PROBLEM:

Large appliance plant needed an efficient centralized system for disposal of corrosive wastes from several plating lines.

SOLUTION:

INDUSTRIAL engineered system (see diagram) provides a central basin for neutralization of all the acid, alkali, cyanide and chrome wastes delivered from rinsing operations. Only small amounts of chemicals are added to precipitate the dissolved metals for separation by filtration. The two compact INDUSTRIAL filters extract the solids and discharge a neutral non-toxic effluent to the city sewage system.

RESULTS:

EQUIPMENT COSTS REDUCED BY ONE-HALF—two push-button Vertical Leaf Filters *replace* expensive clarifier mechanisms, sludge pumps and vacuum filter! . . . 90% LESS SPACE required for entire system! . . . SIMPLE INSTALLATION—no excavation or complex concrete work! . . . DRY CAKE WASTE DISPOSAL—discharged by mechanical shakers directly from filters into trucks!

INDUSTRIAL

**INDUSTRIAL FILTER
& PUMP MFG. COMPANY**

5906 Ogden Avenue, Chicago 50, Illinois

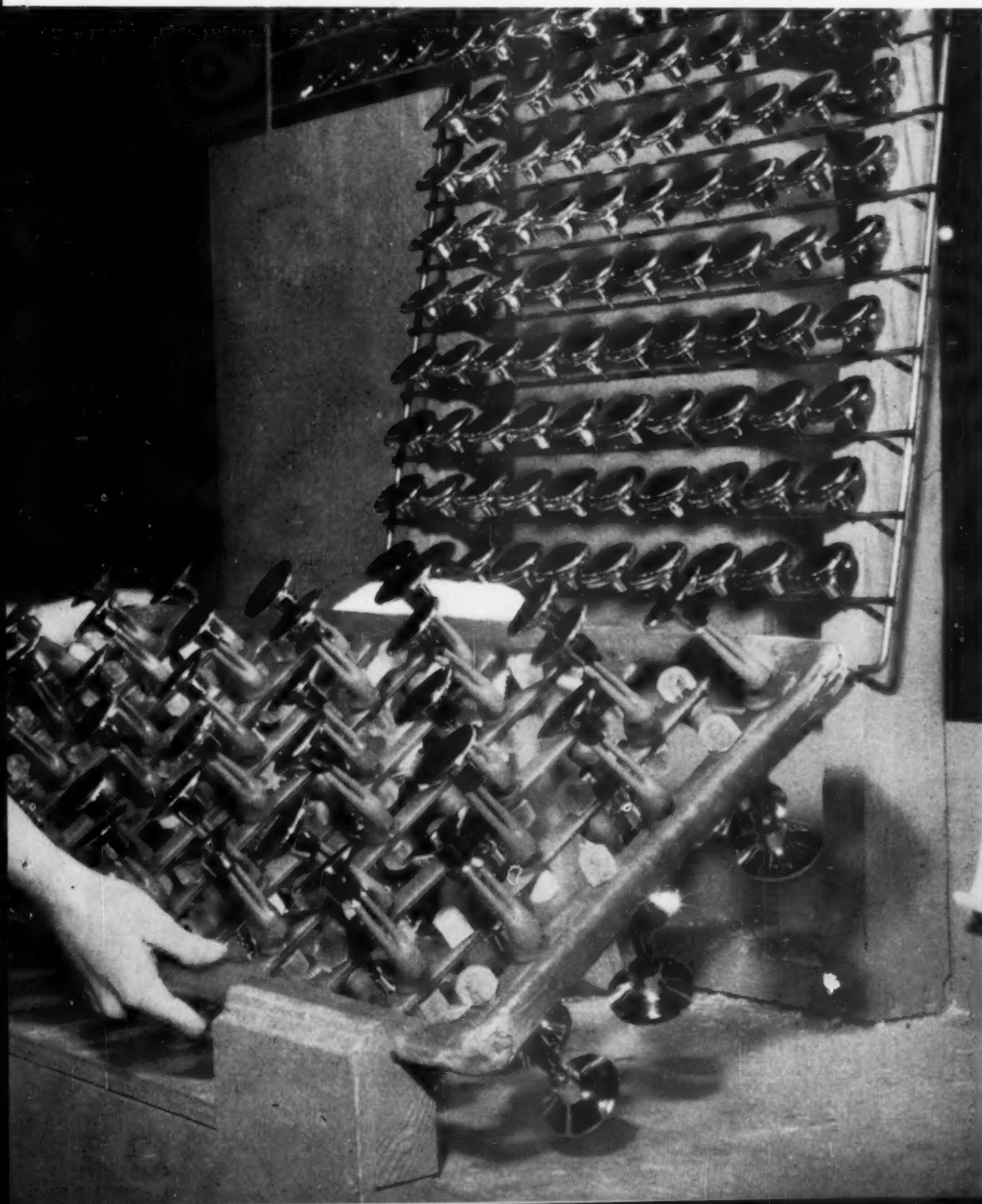
Call or write **INDUSTRIAL** to find
out how an engineered system like
this can solve your specific
plating waste problems.

P-153

PRESSURE FILTERS ♦ ION & HEAT EXCHANGERS ♦ WASTE-TREATING EQUIPMENT

Unique new brightener for zinc and cadmium plated parts has been developed by Federated: CONMAX, a conversion coating for plated finishes from brilliant to iridescent, provides corrosion resistant film to zinc and cadmium plate. Other high quality, low-cost brighteners from Federated: ZIMAX for all types of zinc plating, still, automatic, and barrel; CADMAX for cadmium plating; NIMAX, highly concentrated brightener for nickel barrel plating. These brighteners undergo rigid competitive tests before approval for sale. This also applies to Federated's complete line of plating anodes and nickel salts. It's safest when you specify plating supplies from Federated Metals Division of American Smelting and Refining Company, 120 Broadway, New York 5, N. Y. In Canada, Federated Metals Canada, Ltd., Toronto and Montreal.

FEDERATED METALS DIVISION OF



AMERICAN SMELTING AND REFINING COMPANY

ASAARCO

WILLIAMSVILLE

Bufs

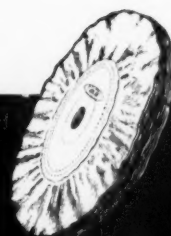


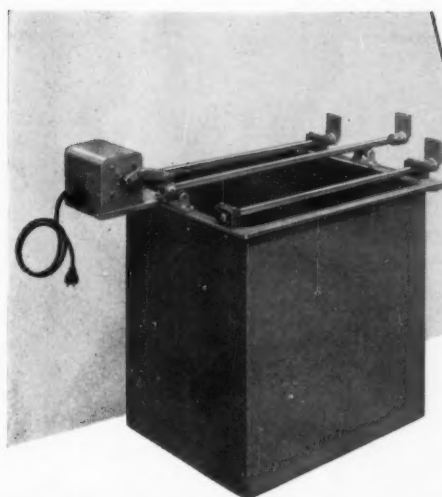
- Cool running
- Cutmaster
- Bias Sisal
- Flexmaster

Consult us now about your needs!

WILLIAMSVILLE BUFF DIVISION

The Bullard Clark Company
DANIELSON, CONNECTICUT





BELKE Rod Agitator for Small Tanks

Variable speed—for rods to 3/4" diameter

The perfect answer to improved plating of printed circuits, precious metals, costume jewelry, and small lot work of all kinds.

Easily installed—Bolts to tank flange.

Speeds—12 to 29, 3" strokes per minute.

Furnished with tank or for tank you have.

BELKE Rod Agitators are available for tanks of all sizes. Send for literature.

4 more cost cutters



New BELKE Air Operated Rinse Hoppers

For low cost, accurately timed rinsing, chromating and bright dip finishing.

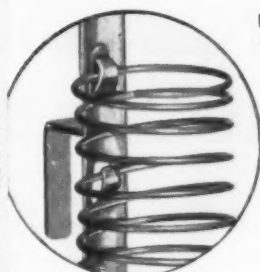
Unit illustrated has three perforated hoppers each independently operated by air cylinders on both sides of the tank.

Hopper No. 2 has automatic timing control for accurate emersion time. Compartment No. 1 and hopper are plain steel. The other compartments are Tygon Lined and Tygon coated; the other hoppers are 3/16" stainless steel.

Available with required number of hoppers, of specified materials, with manual, partial automatic or full automatic operation. See your BELKE Service Engineer or write.

BELKE Weldless Anode Baskets

Withstand the many new solutions that eat up welds.



Note weldless attachment of basket to spine—also extra hook (furnished when specified) used to hold basket high so operator can see when more anodes are needed.

No welds to come open

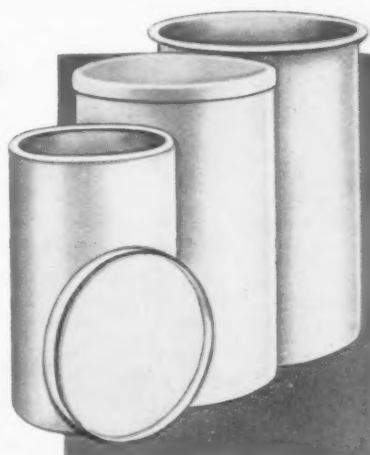
The 3/32" x 1" cold rolled spine is formed at the bottom to hold the basket without welding. Die-formed tongues on the spine hold coils of the .156" Premier Spring Steel Basket.

Available as illustrated or with the extra hook shown in the inset; also curved to specifications. Standard lengths: Dim. A, 6"; Dim. B, 18, 21, 24, 27, and 33 inches.

Polyethylene Tanks and Pails

Corrosion resistant, tough, easy to move. One-piece molded of virgin polyethylene.

	30 gal.	55 gal.
Height	27"	32 1/2"
O.D.	18"	22 1/4"
Walls	3/32"	1/8"
Each	21.75	24.00
with OUTSIDE FLANGE		
No.	30-OF	55-OF
with INSIDE FLANGE		
No.	30-IF	55-IF
Covers		
Each	4.50	6.00
No.	30-IFC	55-IFC



Polyethylene Pails

Have steel bails covered with Tygon Tubing

Qts.	Cat. No.	Price Each
11	11QP	\$3.00
14	14QP	3.50
17	17QP	4.00

Belke

MANUFACTURING COMPANY
947 N. Cicero, Chicago 51

EVERYTHING FOR PLATING PLANTS



If your next move is to
BLACK OXIDE Finish
Make it to . . .



**BLACK
MAGIC**

"The one-bath
black-oxide process"

Important advantages make BLACK MAGIC (type A) for Steel and Iron the blackening process you have been seeking for trouble-free, economical operation. If you are contemplating a change in present procedure, or are about to set up a blackening cycle, consider these points:

- **BLACK MAGIC** process requires only 1 bath, 1 salt! Yes, the same salt mixture that makes up the initial solution is used to replenish dragout.
- **LOWER OPERATING TEMPERATURE!** Type A solution is operated at a boiling point of only 290 F. This saves on dragout, heat consumption.
- **MORE CORROSION RESISTANT!** BLACK MAGIC has high absorption and adsorption qualities for oils and waxes normally used as a final finish dip. This characteristic gives infinitely higher corrosion resistant qualities to the finished part.
- **FASTER BLACKENING CYCLE!** Use of BLACK MAGIC can decrease blackening time cycles 15 to 20%.

Our laboratory is available for processing representative samples. Send us your problem!

**Mitchell-
Bradford**

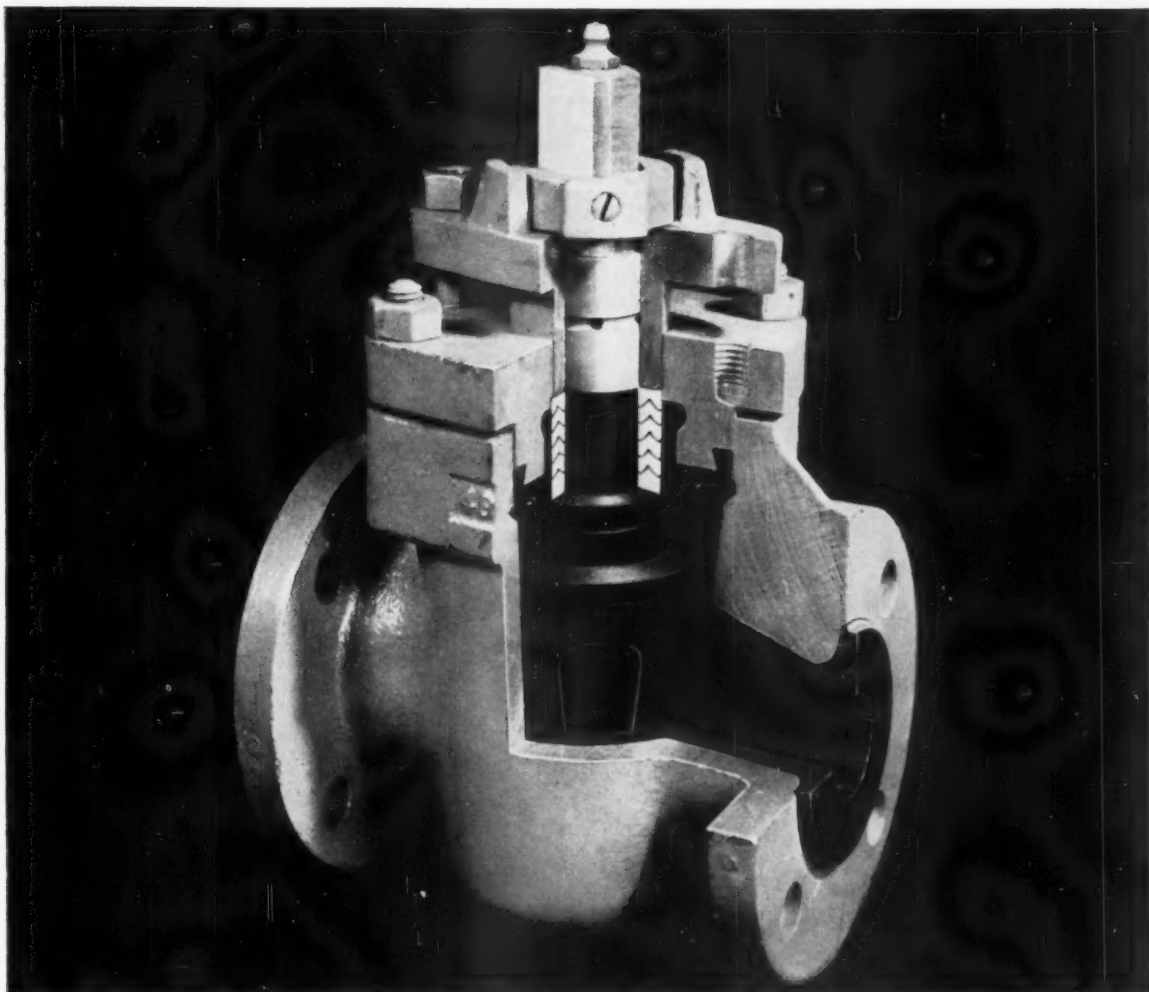
THE MITCHELL-BRADFORD CHEMICAL CO.

Wampus Lane

Milford, Conn.

QUALITY PRODUCTS OF CHEMICAL RESEARCH





You can see why Saran Lined Pipe costs so little per year of service

*Saran anchored within a steel casing safely
conveys corrosive liquids for years of trouble-free service*

There's something special about this valve. It's saran lined and has a Teflon V-ring packing for easier opening and closing and more perfect sealing with less pressure. And yet, the fact that valves like this are stock items is another example of why saran lined piping systems are more economical to install.

Immediate availability of Saran Lined Pipe, valves, pumps and fittings means there's no waiting. And Saran Lined Pipe can be cut and threaded right on the job with conventional tools. This lower fabrication cost, combined with the long

life of corrosion-resistant saran, means that complete saran lined piping systems cost less in the long run.

Saran Lined Pipe with the new gray liner gives trouble-free service under operating pressures from full vacuum up to 300 psi and temperatures from -20° F. up to 200° F.

Send the coupon today to learn how you can save by installing a complete corrosion-free piping system with Saran Lined Pipe, valves, pumps and fittings. And be sure to ask about Saraloy® 898 tank linings. THE DOW CHEMICAL COMPANY, Midland, Michigan.

SARAN LINED PIPE COMPANY
DEPT. 2003 D
2415 BURDETTE AVENUE
FERNDALE 20, MICHIGAN

Please send me information on: ☐ Saran Lined Pipe, fittings and valves ☐ Saran lined centrifugal pumps ☐ Saraloy 898 chemical-resistant sheeting

Name _____ Title _____ Company _____

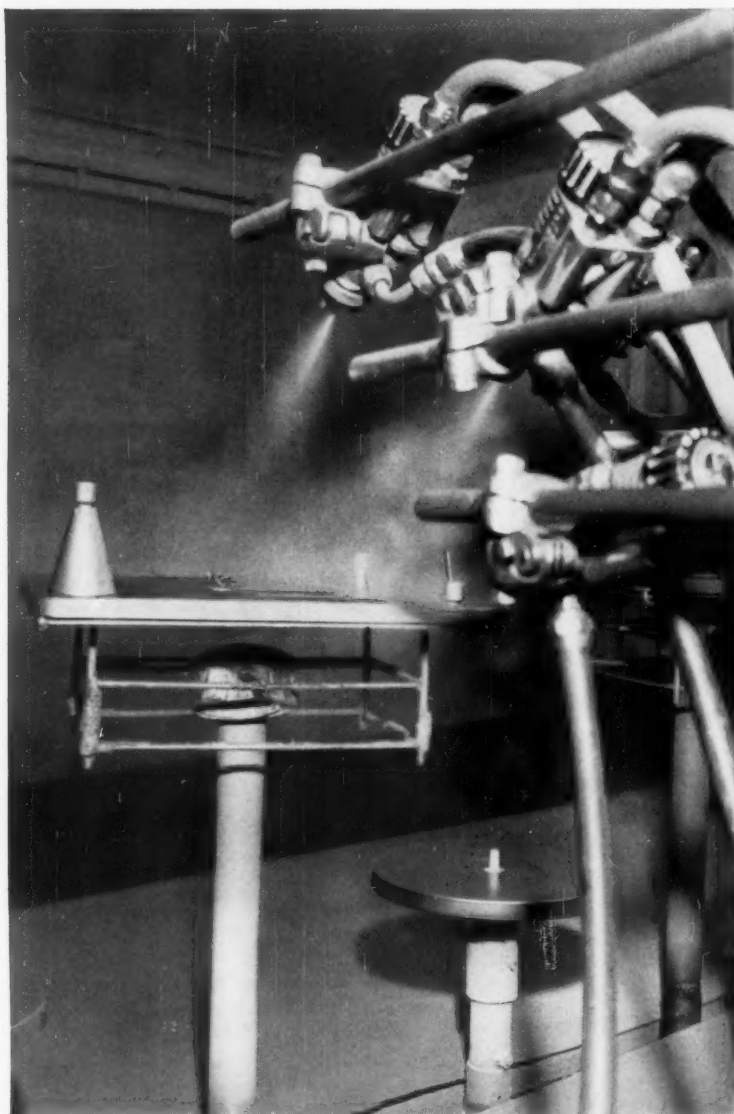
Address _____ City _____ State _____

YOU CAN DEPEND ON

DOW

AFTER TRYING VARIOUS FINISHING METHODS...

RCA chose "controlled" spray by DeVilbiss Automatics



DeVilbiss chain-on-edge spray machine automatically coats two parts in the same spray booth at the same time with high-level guns applying a bronze metallic paint to motorboards, while a few inches away, low-level guns coat turntables with antique white enamel.

THE DEVILBISS COMPANY, Toledo 1, Ohio
Barrie, Ontario • London, England • Branch Offices in Principal Cities

In their search for the best way to apply finishes to "Victrola" components, RCA considered all possibilities.

Their requirements were strict: production rates and quality of finish had to be uniform; material and labor costs lowered; and paint had to be kept off the critical underside area of parts without costly masking or shielding.

The solution: "controlled application" by a DeVilbiss automatic spray system. Now, individual parts move on a DeVilbiss automatic chain-on-edge machine past two spray stations where DeVilbiss automatic spray guns coat them uniformly with controlled paint deposit at speeds up to 600 pieces per hour. Inside the finishing enclosure air is circulated and cleaned by a DeVilbiss air-replacement system to eliminate flaws from air-borne dust and dirt.

Management of RCA's Cambridge, Ohio, Plant has indicated that the new DeVilbiss setup has saved 35% in material, 60% in labor; cut rejects from 20% to less than 1%; given a uniform and quality finish. The equipment is expected to pay for itself in the first 12 months of operation.

Why not call your nearest DeVilbiss branch office today and see how "controlled application" can solve finishing problems not possible by other methods.



NOT AN EXPLORER!

IN ORBIT SINCE 1938

**9
STAR
FEATURES**



LAZO MODEL 2-SH LUCITE PLATING BARREL

... does any type parts, stampings to screws up to 4" dia. ... holds 40 to 150 lbs. ... outperforms any other type ... helps you make more money ... suitable for all plating solutions.

1 Removable Bearings! ... Lazo is the Only Removable Split-Insert Bearing on the market! Disassembly of structure unnecessary! Saves time, upkeep ...

2 Bearing Retainer (External) ... Located on outside lower hanger (both sides). Split-Insert can be replaced simply by sliding bearing into retainer. No disassembly of unit!

3 Cylinder Door! ... Cam lock type. 3 locks insure tight door. Motion cannot loosen nor unseat door. Loading and unloading made quick and easy ... Ordinary type doors are inefficient!

4 Cylinder Gear Ring! ... Lazo is the only cylinder gear ring on the market which is provided with support from one tooth to the other. This adds 60% greater tooth strength to the unit! ...

5 Cam Locks! ... Locks exert progressive pressure against door and seating. Not the common type of door fastener!

6 Hanger Arm (lower) ... Lazo Hanger Arm is a 2-piece assembly: upper and lower member. The lower arm only, is subjected to corrosive chemicals, not the upper arm, as in ordinary barrels.

7 Hanger Arm (upper) ... The ordinary cathode system is a one-piece steel arm which tends to short-circuit. This cannot occur in the Lazo 2-piece arm. The Lazo upper arm is made of canvas base Bakelite, same as is used for switchboards to insure 100% strength and insulation against electrical current ...

8 Super High Grade Alloy Bearings! ... Lazo is the only plating barrel manufacturer using All Nickel, Chrome-Type bearings, for the trunnion shaft, in complete cycle plating.

9 Cylinder Plating Method — Patented! ... First introduced by Lazo in 1940. U. S. Pat. 2491925. Can. Pat. 445821. Patented in 2 series ... **Every Other Lucite Ribless Plating Barrel Today is Only An Imitation of the Lazo!** ... Specify Lazo! Does it better!

Specifications:

Size: 14" x 30"; Inside cylinder
Size, overall: 50" x 29" x 32" high
1/8" standard perforations
Lucite: door, 5/8" thick
panel, 1/2" thick
heads, 1" thick



HARDWOOD LINE MFG. CO.

Lucite Cylinders For Complete Cycle Plating

UNEXCELLED SERVICE

2022 N. California Ave. — Chicago 47, Illinois — Dickens 2-9393

Originators of Ribless Plating Barrels

You Can Depend on LAZO — Originators of the Lucite Plating Barrel



NOW!

*The Most Complete Line
of Quality*

COLOR PASTES

for EPOXY RESIN Compounds

from a long established,
reliable, centrally located
Chicago manufacturer

*The Most Complete Line
of Tailor-Made*

EPOXY COMPOUNDS

Code No.	Name	The vehicle portion of all the Epoxy Dispersions employs the finest quality (100% solids) liquid Epoxy Resin on the market today. All colorants used have excellent resistance to color change due to the effects of light and heat.
2-M-302	Plastic White	
2-M-303	Permanent Black	
2-M-304	Primrose Yellow	
2-M-305	Orange	
2-M-306	Glass Green	
2-M-307	Blue	
2-M-310	Mercadium Red	

Special shades of color dispersions can be manufactured for quantity users. Every user of Epoxy Compounds or Resins should carry a line of CLINCO Epoxy Dispersions. This will enable you to transform any color of Opaque Epoxy Compound which you are now using into a variety of bright colors.



Your Inquiries Invited. Write or Phone for Complete Details.




THE CLINTON COMPANY

PIONEERING QUALITY INDUSTRIAL FINISHES SINCE 1928

1220 ELSTON AVE. • CHICAGO 22, ILL.

Phone: ARmitage 6-7760



It will pay you to investigate

"Bright LUSTRALITE® 10"
the revolutionary

BRONZE PLATING DISCOVERY that speeds
and improves electroplating at lower
production cost ...

"Bright LUSTRALITE 10" has proved its superior qualities in day-to-day use on products like these and many others. It definitely makes finishing less expensive by eliminating buffing and minimizing the need for nickel. Yet it has excellent resistance to corrosion. The plate has exceptional leveling power, with a true bright finish.

"Bright LUSTRALITE 10" produces a brilliant, fine-grained hard bronze that's practical for both decoration and corrosion protection. Available through the same distributors that handle other Battelle processes listed on the opposite side of this page.

SEE OTHER SIDE FOR DISTRIBUTORS

... For more information about Battelle-developed processes, get in touch with any of these authorized Battelle Development Corporation distributors. Each is fully equipped to give you complete data and technical help.

**THE ENEQUIST
CHEMICAL COMPANY**
100 Varick Avenue
Brooklyn 37, New York

P. B. GAST AND SONS
1515 Madison Avenue, S. E.
Grand Rapids 7, Michigan

**THE GLOBE CHEMICAL
COMPANY**
Murray Road at Big Four R. R.
Cincinnati 17, Ohio
—also Dayton and Louisville

HYDRITE CHEMICAL COMPANY
605-621 South 12th Street
Milwaukee 4, Wisconsin

KOCOUR COMPANY
4802 South St. Louis Avenue
Chicago 32, Illinois

LASALCO, INCORPORATED
2818 LaSalle Street
St. Louis 4, Missouri

G. S. ROBINS AND COMPANY
126 Chouteau Avenue
St. Louis 2, Missouri

SCOBELL CHEMICAL COMPANY
Rockwood Place
Rochester, New York

Be sure to read about "Bright **LUSTRALITE 10**"
on the opposite side of this page . . .

other Battelle Processes that simplify plating, add beauty and improve products

Electropolishing

A wide range of finishes is available. Gives products new sales values. Extraordinary smoothing action produces a micro-polished effect. "True metal color" is achieved with a lustre not attainable with belts or wheels. Metal surfaces remain undamaged.

Electrodeburning—A variation of electropolishing, excellent for smoothing sharp, burred metal for safe handling and precision functioning. Indispensable for parts having burrs in hard-to-reach places. For many items, electrodeburning plus electroplating produces the best possible and most economical finish.

Chemical Polishing

Smooths as it brightens. Won't etch. Brings out basic lustre. Especially suitable for small parts and those of intricate design. Can be plated over. Easy to install and operate . . . requires only a tank and heating element.

STANDARD[®] Bright Nickel

Produces mirror-like surfaces. Has excellent leveling action, ductility, and corrosion resistance. Very hard (Knoop 500-580) and wear resistant. On 18-gauge steel, can be bent around a 1/2-inch radius without cracking.

Tin Immersion

Coats copper and a variety of brasses and bronzes against "green water." Coats wires against corrosion. Easily controlled cold bath.

LUSTRALITE[®] Electroplating Processes also include LUSTRALITE 20, a rich golden plate; LUSTRALITE 10, a deep bronze red; and LUSTRALITE 45, silver white, of sterling appearance. Data upon request.

Please let me have more information. I am particularly interested in the following Battelle processes:

YOUR NAME _____
TITLE _____
FIRM NAME _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

want more data?

**mail coupon
to distributor
nearest you**

OFHC[®] ANODES

And OFHC[®] Anodes are made only
from OFHC Copper!

OFHC is high-conductivity,
oxygen-excluded copper. It is
not deoxidized copper.

When you use OFHC Anodes, some
of the advantages you get are:

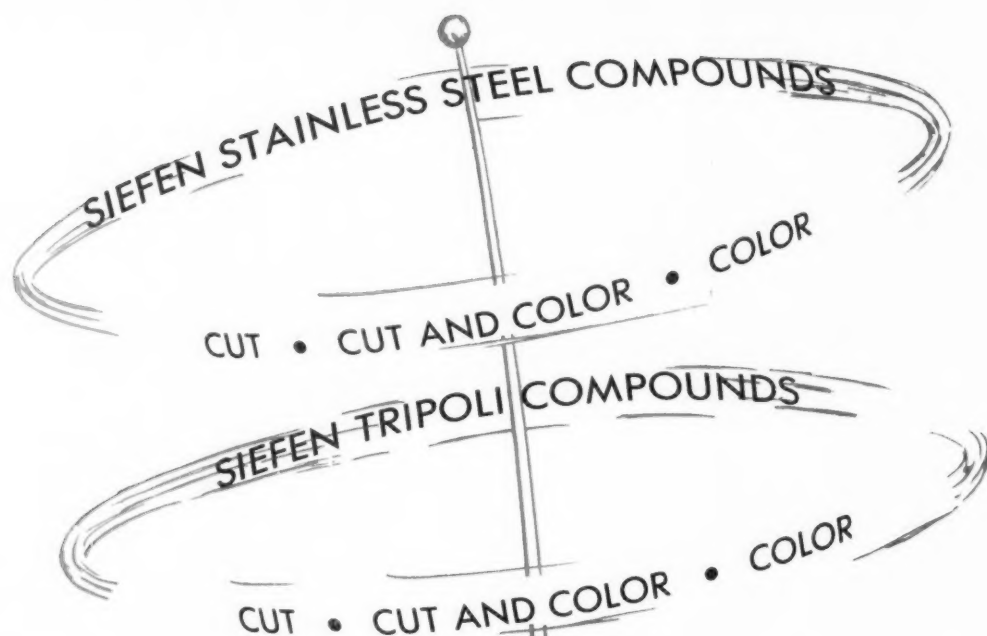
- more usable copper per anode •
- smoother finishes •
- product uniformity •

Nationwide supply and
technical assistance are available
through our sales offices
or your local OFHC
Anode distributor.

AMERICAN METAL CLIMAX, INC.
61 Broadway, New York 6, N. Y.
BOSTON • CHICAGO • DETROIT • LOS ANGELES



MADE ONLY BY AMERICAN METAL CLIMAX



SIEFEN STAINLESS STEEL COMPOUNDS

The J. J. Siefen Co. has the correct liquid stainless steel compounds for all ferrous metals

For Use on Tampico Wheels
To Produce Stain Finishes
For Use on Sisal Buffs
For Fast Cut on Cold Rolled Steel
For Cut & Color on Stainless Steel
For Use on Loose Muslin or Linen
Buffs for Color

**Our
31st Year**



SIEFEN LIQUID TRIPOLI

Siefen's Liquid "Tripoli" Buffing Composition with cutting, cleaning and color abilities will do your buffing job on all non-ferrous metals.

Buffing Copper-Plated Automotive Parts, Zinc Die-Cast Hardware and Automotive Parts, Aluminum Kitchen Utensils and Automotive Parts, Brass Escutcheons, Plastic Handles for Cutlery.

Call on Siefen for information on finishing problems. For thirty-one years we have been solving problems for the metal finishing field.

J. J. Siefen CO.
5657 LAUDERDALE DETROIT 9, MICH.





The "run-in" media *instantly* ready for top efficiency



TUMBLING CHIPS



Fused crystalline aluminum oxide abrasive chips with each particle dense and solid with multiple abrasive surfaces. *Pre-tumbled* for immediate "run-in." Hard and tough. No sharp edges or flat spots. New standards of sizing provide wider range, more accuracy and help avoid wedging in recesses of parts being tumbled. Write for bulletin ESA 236.



CALL YOUR SIMONDS
DISTRIBUTOR



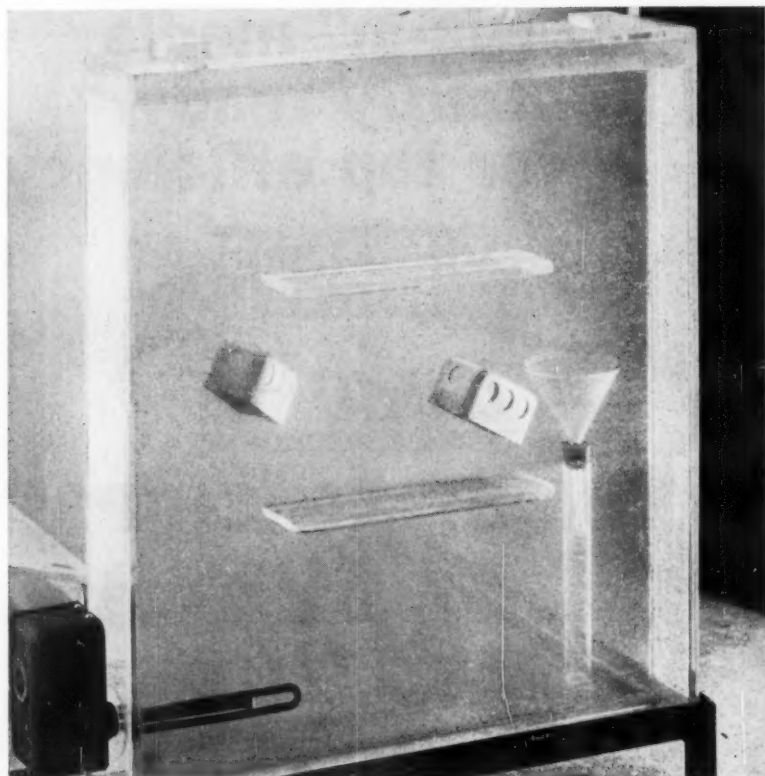
Proven products
Dependable know-how
Quick supply

SIMONDS ABRASIVE COMPANY

Tacony & Fraley Sts., Philadelphia 37, Pa.

Division of Simonds Saw and Steel Co.

BRANCHES: Chicago • Detroit • Los Angeles • Philadelphia
Portland, Ore. • San Francisco • Shreveport



Sets New Standards for Industry's Testing:

1. "Corrodkote"
2. Humidity
3. Salt Fog

(left) Unretouched photo during test shows fog plainly visible through water jacket "picture window" in Singleton "H-T Sincolite" Corrosion Test Cabinet.

Singleton Cabinet "Visibility" Aids Tests, Improves Accuracy

Exclusive Design and Performance Features of Singleton "H-T Sincolite" Corrosion Test Cabinet Set New Standards for Accelerated Exposure Tests.

Visual Fog Control — Full length "picture window" visibility. Observe details of procedure without interrupting test or handling specimens. "See" tests in process for more comprehensive data.

Water Jacket Heaters — Full length of cabinet, front and back, for uniform temperature throughout. Users report "results within 10% of absolute duplication". No "hot bottom".

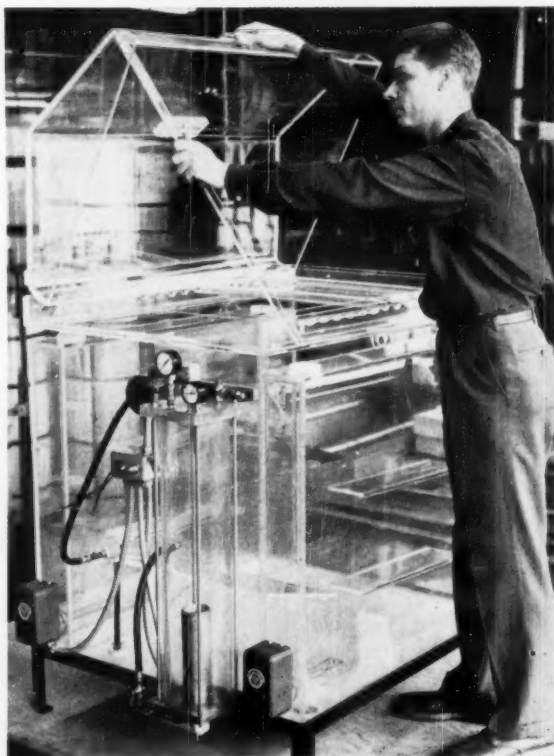
Lasts Years Longer — Fusion-Welded "H-T Sincolite", permanent; can't corrode or become contaminated. No deterioration.

Critical importance of accelerated corrosion tests today require the extraordinary accuracy and superior characteristics of the Singleton Cabinet — only one of its kind made of clear, transparent "H-T Sincolite". Non-porous, inert to test solutions, it prevents secondary galvanic acceleration of corrosion. Complete absence of deterioration and maintenance extends service life years longer. No parts of contaminating materials susceptible to corrosion are exposed to test solutions or vapors. All gauges and metal parts are on the outside. Controls at left end. Built to meet all existing A. S. T. M. and U. S. Gov't Specifications for this type of equipment.

Get complete details. Send for Bulletin T Cab 103

The G. S. Equipment Co.

15585 Brookpark Road Cleveland 11, Ohio CLeaver 2-4774



IMMUNOL

Reg. U.S. Pat. Off.

can be used to improve 22 metalworking operations!

Use IMMUNOL, the neutral, non-toxic, non-flammable, odorless solvent to improve your metalworking operations. This widely used product eliminates the fire hazard, is inexpensive and odorless. It is available in several grades to be mixed with water for:

Rustproofing

to protect cast iron and other ferrous metals against rust for long or short periods of time.

Cleaning

to quickly clean oil, grease, soil and dirt from any metal surface from small parts to heavy machinery.

Cleaning and Rustproofing

to leave a protective rustproof surface as it cleans, so minute it cannot be seen or felt.

Magnetic Inspection

to replace kerosene or mineral spirits and safely reduce costs, speed production, improve definition.

Adding to Soluble Oils

a 1:50 mixture gives cooler work, better tool life, better finishes, additional rust protection.

Buffing

to insure swift and complete removal in cleaning.

Plating

to remove all surface residues in preparation for plating and as an additive to final rinses.

Honing

to aid in heat convection and release stone dust.

Cutting

to increase penetration, lower surface tension, insure cooler work, better finishes.

Grinding

to increase heat convection of coolant, wet out metallic silt and wheel dust.

Tumbling

to shorten the cycle, insure cleaner, rustproofed work.

Degreasing

to reduce costs, improve results, eliminate dermatitis and other hazards.

Solvent Replacement

to remove cutting oils from machined parts, at lower costs, without hazards.

Hydrostatic Testing

to give water clear, rustproof solutions.

Quenching

to prevent rusting of tank and metals quenched.

Rustproofing Internal Systems

one part to 2500 parts plain water, prevents rusting.

Dispersing Silt

to facilitate cutting and grinding operations by dispersing and sinking metallic silt particles.

Heat Convection

to increase the convection property of plain water used for cooling, frictional heat or quenching.

Lowering Surface Tension

to insure faster penetration of liquids.

Emulsifying Fats

to carry them off and clean the receptacle.

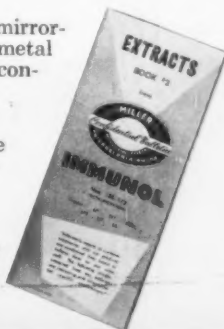
Sealing Aluminum

after anodizing to produce a mirror-like finish, seal the pores of the metal and make it more resistant to contamination.

Replacing Vapor Degreasing

to clean better, rustproof the metal, eliminate odors, skin irritations, the dangers of fire.

Write for this free booklet. It describes in detail the many outstanding results users have obtained with IMMUNOL.



Manufacturers of
HAMIKLEER, ACTIVOL, HAMICOTE,
STEELGARD, IMMUNOL

HARRY MILLER CORP.

Original Products and Processes Since 1936

4th and BRISTOL STS., PHILA. 40, PA.
DAvenport 4-4000 Service Representatives in Principal Cities

PROMAT: YOUR BEST SOURCE OF FINE CHEMICALS AND PROCESSES IN METAL FINISHING

HERE'S WHY

For almost twenty years PROMAT has been supplying the metal finishing industry with the finest in chemical products and processes relating to the finishing treatment of metals.

PROMAT manufactures an unexcelled line of ZINC BRIGHTENERS, CADMIUM BRIGHTENERS, ELECTROPOLISHES, ANTI-FOAM AGENTS, DOCTOR'S SOLUTION, CLEANERS, RUSTPROOFERS, and CHROMATES.

PROMAT'S achievements in CHROMATE PROCESSING are well known and include a variety of applications such as single or double dip processes, brighteners, and O.D. colors available for ZINC, CADMIUM, and ALUMINUM.

TECHNICAL ASSISTANCE

is yours for the asking from PROMAT'S service department where highly skilled technicians stand ready to serve you in the solution of any metal finishing problem you may have.

To obtain technical bulletins relating to any of PROMAT'S fine line of chemicals, or to receive PROMAT'S monthly publication "Progress," write to



**PROMAT
DIVISION
POOR and Company
851 S. MARKET STREET
WAUKEGAN, ILLINOIS**

PROMAT'S products are manufactured in the United States, Canada, Great Britain and West Germany, and sold throughout the free world. PROMAT'S manufacturing plants in the United States are located in Waukegan, Illinois and Gardena, California.

40/Circle on Readers' Service Card

LAMINATED FOR FIBERGLASS FOR CORROSION RESISTANCE



TANKS

Fabricated
to your
Specifications

NO MOLDS NEEDED—Made any size, any shape, at no extra cost and no loss of delivery time.

UNIFORM DIMENSIONS — NO TAPERING — Dimensions are same at bottom and top . . . means larger capacities than tapered molded tanks.

FLANGES, DAMS, Etc. — Can be inexpensively equipped with flanged connection, holes, overflow dams, baffles, separations, etc.

CHEMICALLY RESISTANT THROUGHOUT — Fabricated from *iolyte* sheet properly reinforced. This is a structural material . . . not a lining.

Write for literature, prices, and table of chemical resistance for *iolyte* tanks, crocks, ducts.



Available
from Stock



CROCKS

PRICE LIST

Gal. Cap.	Outs. Diam.	Outs. Hght.	List Cost	Gal. Cap.	Outs. Diam.	Outs. Hght.	List Cost
5	9"	18"	18.00	14	18"	12"	35.00
5	10"	15"	18.00	20	18"	18"	40.00
5	12"	16"	22.00	26	18"	24"	45.00
8	12"	20"	24.00	30	18"	28"	49.00
10	12"	24"	26.00	40	18"	36"	59.00
12	12"	24"	23.00	50	18"	48"	69.00
9	10"	24"	21.00	27	22"	18"	49.00
7	9"	12"	26.00	30	22"	20"	53.00
10	16"	14"	28.00	35	22"	36"	70.00
12	16"	18"	33.00	73	22"	48"	83.00
15	16"	24"	40.00	55	28"	22"	76.00
20	16"	36"	49.00	93	28"	36"	98.00
30	16"	48"	59.00	125	28"	48"	125.00



DUCTS

ANY DIMENSIONS ANY CURVES ANY LENGTHS

iolyte has greater resistance to chemical attack than stainless, Monel, or aluminum. 1/5 the weight of steel, it is superior in tension, flexural, and compression strength. Unlike thermoplastics *iolyte* will not heat-distort below 350 deg.

Send drawings or prints for quotes and ask for literature giving chemical resistances.

Order from us or your distributor. Unless rated firm, payment with order. No COD's.

ALL PRICES F.O.B. FACTORY

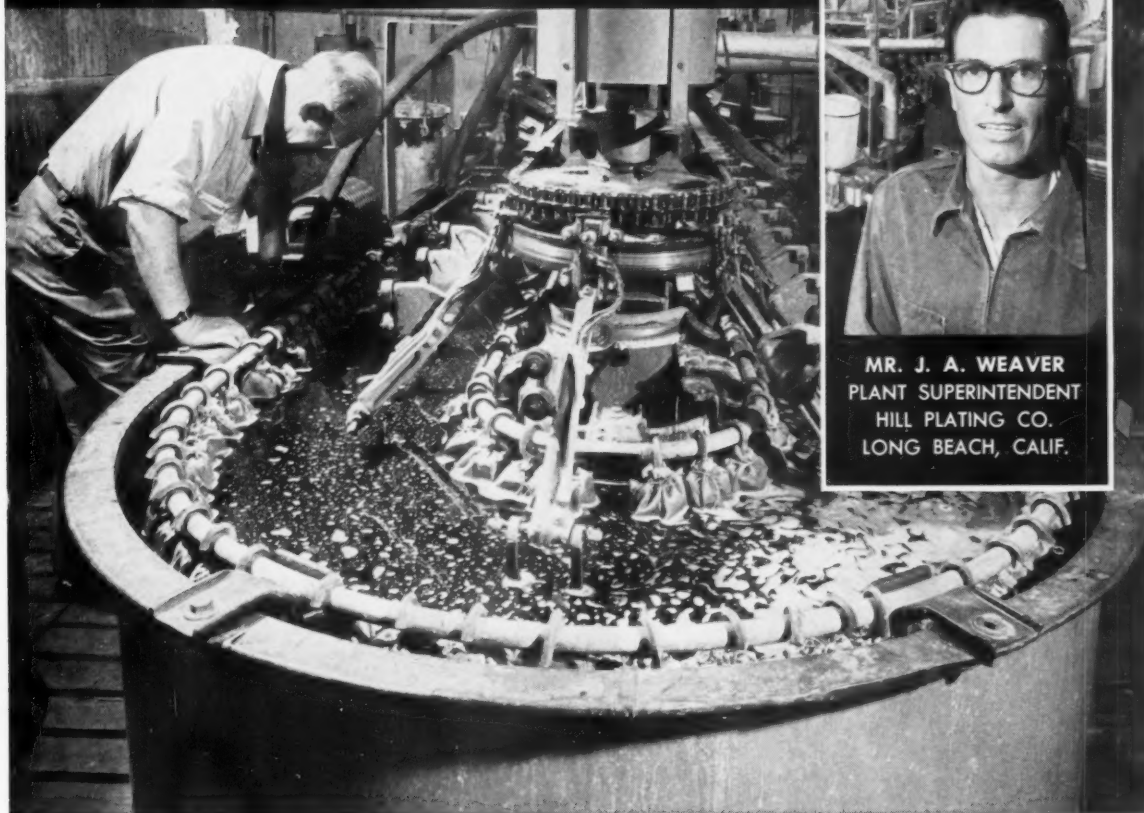
SCHORI PROCESS DIVISION

FERRO-CO CORPORATION

8-11 43rd ROAD, LONG ISLAND CITY 1, N. Y.
FACTORY: 59-31 54th STREET, MASPETH, L. I.

41/Circle on Readers' Service Card

**"THIS STEVENS MACHINE LOWERED OUR
PLATING COST BY 30%" says**



MR. J. A. WEAVER
PLANT SUPERINTENDENT
HILL PLATING CO.
LONG BEACH, CALIF.

"...and *tripled* our man-hour production rate!"

The Hill Plating Company has discovered that their installation of a STEVENS "Little Steve" Automatic Plating Machine, has not only done away with the usual problems of hand line operating . . .

IT HAS ALSO . . .

- Lowered unit costs
- Met all production requirements with ease
- Released workers for other inter-plant tasks
- Saved up to 50% in plating solutions

And, along with these economical developments, the Hill Plating Company is now enjoying the even balance of production and labor that *only* accompanies automatic plating!

If your present method of plating is keeping your processing costs up, why not let your local STEVENS Sales Representative show you the *profitable* way to increase production!

Remember — When you go automatic . . . go STEVENS!

frederic b.

STEVENS, inc.

DETROIT 16, MICH.

BUFFALO

DAYTON

CHICAGO

NEW HAVEN

DETROIT

CLEVELAND

SPRINGFIELD (OHIO)

GRAVER SYSTEMS SIMPLIFY TREATMENT OF COMPLICATED PLATING WASTES at MARTIN-ORLANDO

Building missiles is a complex job. Thousands of intricate parts must be machined to close tolerances and plated or coated with a wide variety of materials to resist corrosion and guarantee dependable performance during flight. Many are chrome plated, silver plated, anodized, phosphatized, pickled, passivated or processed in other ways. An unusually large number of acid and chemical wastes results, including nitric acid, hydrofluoric acid, sulfuric acid, caustic and cyanide. Handling these wastes is a complex problem in itself.

Martin-Orlando of Florida, builders of guided missiles, selected Graver to supply all units and auxiliary equipment for a treatment plant based on plans and specifications prepared by the Architect-Engineers. Graver, working with the consulting engineers, fabricated and installed a plant which handles this treatment problem simply and directly. Four integrated systems effectively treat all wastes in the spent baths and rinse. The plant is safe, efficient and simple to operate and maintain.

This installation is only one of the many modern plating waste treatment systems Graver has furnished for large and small manufacturers in every field. Graver supplies all types of equipment, from simple units to entire plants and makes available a complete service, including research and development, manufacturing and installation, when required. Whatever your waste treatment requirements, Graver has the modern designs, equipment and processes to do the job efficiently... economically. Every installation is tailored to specific needs.

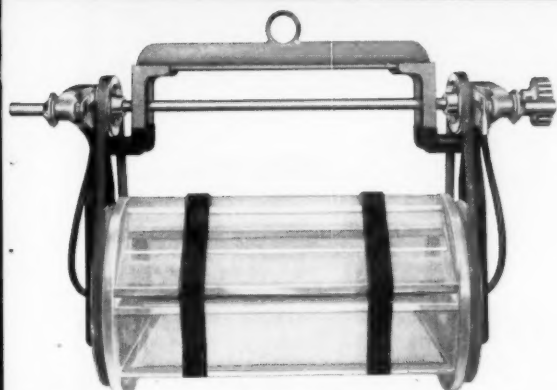


Industrial Waste Treatment Dept. W-520
GRAVER WATER CONDITIONING CO.
Division of Union Tank Car Company
216 West 14th Street, New York 11, N. Y.

WRITE
FOR
INFORMATION
AND
LITERATURE!

Architects & Engineers:
Connell, Pierce,
Garland & Friedman
Miami, Florida

the NEW STUTZ COMPLETE CYCLE BELT DRIVEN PLATING CYLINDER



MODEL A

- NO CYLINDER GEARS • NO CYLINDER BEARINGS
- LOWEST POSSIBLE MAINTENANCE
- HIGHEST POSSIBLE CURRENT

These units are the result of our experience with industry and service plating. The belt design has now proven superior to gear driven types, and with outboard mounted driving pulleys, belts can be changed if necessary, in seconds without tools. In addition to our own equipment these units made to fit all makes of plating tanks and furnished also with motor drives mounted directly on cylinder superstructure. Cylinder current horns are heavy copper alloy and are sized for either four or three horn saddle contact. Cathode contactors are dangle type, others available. Standard sizes 14"x30" and 14"x36" (I.D.) 12 additional sizes from 12"x24" to 18"x42" (I.D.) Standard perforations 3/32" round on 3/16" centers. Special dual openings for processing of extremely small parts available.



This design incorporates cylinder pulleys separate and smaller from the cylinder head. The hanger arms are semi-steel castings protected with 5/16" thick special vulcanized hard rubber.

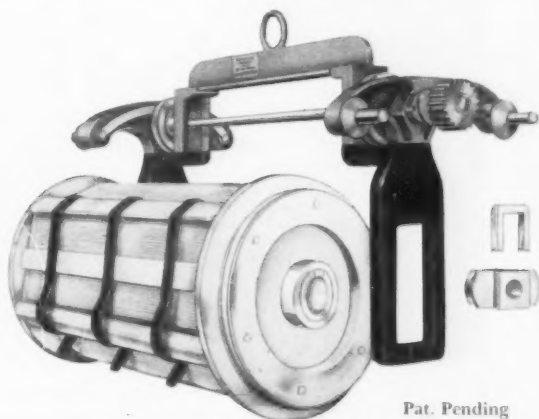
Specially designed counter pulleys of monel metal or plexiglas with deep dimples for positive grip against belt face.

Pat.
Pending

This shows the belt expanding into the dimples of the driving pulleys. This action provides positive pull with no abrasion to the belt whatsoever.



Simply lifting the top piece vertically from the dangle holder, allows the holder to be withdrawn through the hanger slot. This releases the cylinder from the hanger.



Pat. Pending

STUTZ PORTABLE PLATING BARREL

★ Baskets in perforated metals or wire mesh

★ Load/Unload Stand for convenient and fast handling of work load

The Stutz Portable Barrel is made in 2 standard sizes with cylinders having inside dimensions of 6"x12", 8"x18" and 10"x18" I.D. Smaller upon application. Standard openings are 3/32". Smaller or larger openings can be furnished as required.

Write for Catalog and Prices

We Invite Your Inquiries



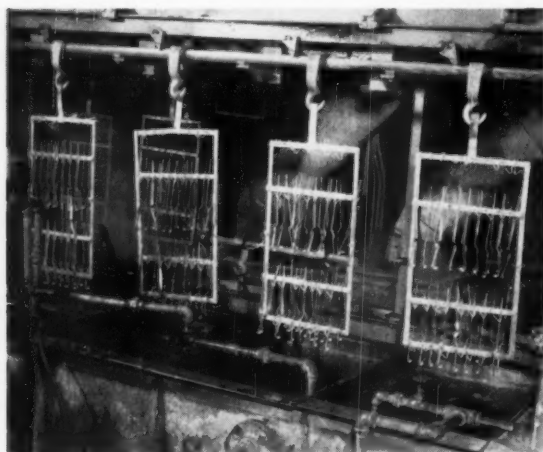
THE **STUTZ** COMPANY
4430 West Carroll Ave., Chicago 24, Illinois
Complete Metal Finishing Equipment and Supplies

AETNA saves 80% with KENVERT®



Figures compiled over a year's time show that Aetna Electroplating, in their large modern Philadelphia plant

have had an 80% savings using Kenvert products.

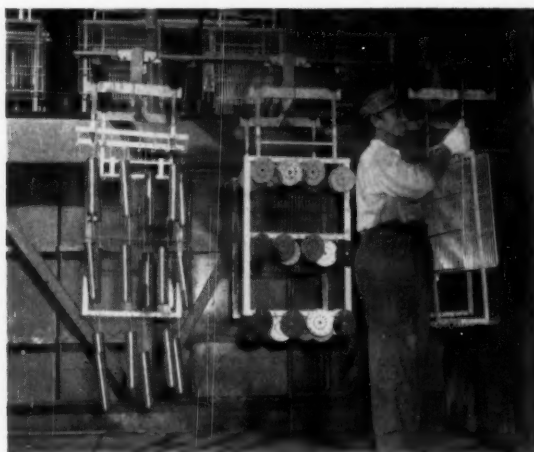


Kenvert #27, a one dip brightener and passivator for cadmium, gives a bright, white uniform cadmium plate passing all requirements of salt spray and lead acetate for Aetna's electronic, business machine and government customers.

Kenvert #25, an all organic grain refiner and cadmium plate brightener, provides a plated surface with excellent solderability, good ductility and uniform chromating characteristics for Kenvert #27.



Quality controls are maintained by technicians in Aetna's modern laboratory.



Kenvert #17A on zinc meets the cycling and treating requirements of both Aetna's automatic plating machine and crane-operated 16 foot zinc plating and treating tank line.

Kenvert #32 offers anti-staining qualities to copper plate.

New Kenvert products are constantly being developed for your most exacting finishing requirements. For information or demonstration contact your nearest distributor.



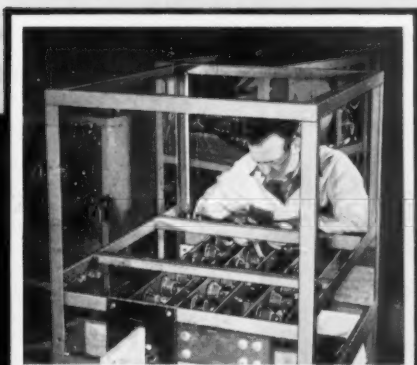
CONVERSION CHEMICAL CORPORATION

98 E. Main Street, Rockville, Conn.
Phone: TRemont 5-3357

DISTRIBUTORS: ALERT SUPPLY CO., Los Angeles, San Francisco; ARDCO INC., Chicago; M. E. BAKER CO., Cambridge, Mass.; BISON CORP., Canton, Ohio; DON BLUM & CO., Rochester, N.Y.; CHIPMAN SUPPLY CO., Cincinnati; S. A. DAY CO., Buffalo, N.Y.; FOY ELECTRO CHEMICAL CO., Ansonia, Ct.; CHARLES C. FREE, Pittsburgh, Pa.; GREAT WESTERN CHEMICAL CO., Seattle, Wash., Portland, Ore.; HOWARD W. GRIPTON, Phila., Pa.; LEA MFG. CO., Waterbury, Ct.; GEORGE NANKERVIS CO., Detroit; PLATERS RESEARCH CORP., Chicago, N.Y., N.Y.;

LICENSEE: NICROMATIC LTD., Toronto, Canada.

Products for Progress In Metal Protection



A NEW "PRODUCT FOR PROGRESS IN METAL PROTECTION"—

The Wagner Brothers Silicon Electroplating Rectifier. Unequalled freedom from maintenance and down-time at approximately the same cost as selenium, less than germanium rectifiers. Twelve high purity silicon cells over 1" in diameter provide great ability to withstand transients of several hundred volts. Outstanding efficiency even in high ambient temperatures to 200°.

Wagner Brothers' finest Product for Progress in Metal Protection is Service. Whether you use Wagner Brothers' anodes, chemicals, rectifiers, automatic plating machines and parts handling equipment — any or all of these — their performance is magnified to a large degree by the periodic or specific attention our sales representatives provide. They not only work right along with you and your plating department, they take your problems back to Wagner Brothers' research staff for the finest analysis and solutions available in the industry. For complete information on the Wagner Brothers line of Products for Progress in Metal Protection — or for immediate assistance — write or call the Wagner man in your area or contact the factory sales offices in Detroit.



MANUFACTURERS AND PROCESSORS OF ALL METAL-FINISHING CHEMICALS, ANODES, AND EQUIPMENT

CHICAGO • CINCINNATI • CLEVELAND • INDIANAPOLIS • LOUISVILLE • NEW YORK • SYRACUSE • GRAND RAPIDS

418 MIDLAND AVE., DETROIT 3, MICHIGAN





— for the Brightest Nickel ever . . . right out of the barrel!

Jelco BARREL NICKEL Brightener

Can be used in your present regular solution with standard equipment

- *Maximum brightness*
— *with minimum solution control*
- *Single addition agent*
- *For use in Hot or Cold solutions*
- *Highly ductile deposits*
— *excellent throwing power*

A Proven Process . . . Used successfully
by manufacturers and job platers

Non-Critical
Boosts Production
Cuts Rejects

The latest
advance in
Barrel Nickel
plating

• *Write for
complete
information*

For the "Solution to your Plating
Problems" . . . Come to

JELCO

FINISHING EQUIPMENT CORP.

153 EAST 26th STREET • NEW YORK 10, N. Y.

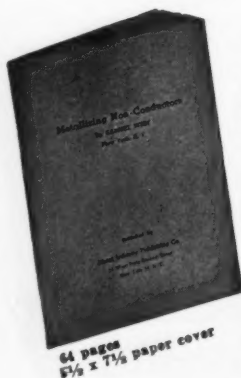
Telephone: LExington 2-3055

47/Circle on Readers' Service Card

BOOKS FOR THE PLATER

Metallizing Non-Conductors

By SAMUEL WEIN



64 pages
5 1/2 x 7 1/2 paper cover

The present work deals with every known method for "metallizing" or the deposition of metals by electrolysis (plating) or non-conductors. It is divided into several sections, i.e., those processes which use chemical, mechanical and physical methods for treatment of surfaces for metallizing. In these groups the specific methods are chronologically reviewed and so the reader can very readily get a better idea of the progress made by the various workers in these arts. At the end is an alphabetical listing of contributors to the art, so that the serious workers can refer to the original sources of the information given in the text by Mr. Wein.

The text is prepared in a practical fashion so that the formulas given will be of material use and is the result of literature collected by the author for more than 25 years and which has been in use by a number of industrial concerns here in the United States and abroad.

PRICE \$2.00

Dictionary of Metal Finishing Chemicals

By HALL and HOGABOOM



129 pages
5 1/2 x 8 1/2 cloth bound

This volume fills the need in the metal finishing field for a handy source of information concerning the chemicals employed. The technical and common names are listed in alphabetical order together with information as to physical appearance, chemical formula, molecular weight, melting and boiling points, and solubility. Available grades, types and sizes of shipping containers are also given, all of which are of help in identifying the contents of unlabelled packages which are found in most plating rooms. A special section contains tables of degrees, Baumé and specific gravity for solutions of a great many salts. Various solutions and dips employed in the finishing department may be easily controlled by the use of a hydrometer and these tables. The authors, editors of the *Plating & Finishing Guidebook* and associate editors of *Metal Finishing*, as a result of their familiarity with the requirements of the industry, have compiled a reference volume which belongs on the shelf of every metal finisher.

PRICE \$3.00

BOOK ORDERS PAYABLE IN ADVANCE

METAL FINISHING

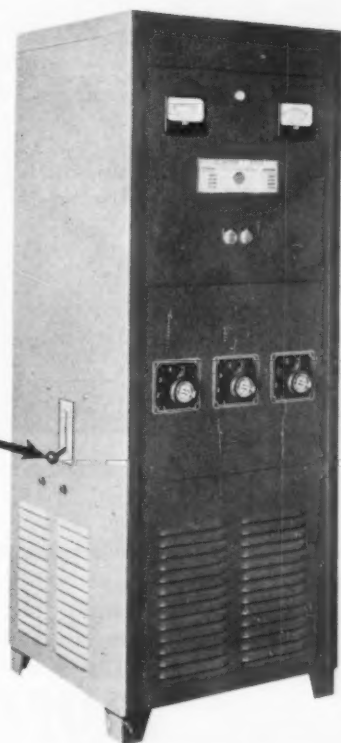
381 Broadway, Westwood, N. J.

Clinton HEAVY DUTY Platers



The "Dual-O-Matic" Transformer circuit manually operated from the Hi Lo voltage selector switch was developed and perfected by our Rectifier Research Division. It is used exclusively in rectifiers manufactured by our company.

This new type transformer circuit is revolutionary in design and function as it permits the maximum name plate DC amperes rating to be drawn on either the 2 or 12 volt operating range without reconnecting external DC bus in series or parallel connection.



Available in the Following Sizes:

MODEL	DATA	PRICE F.O.B. CHICAGO
1012HO2	1000/1000 A 2-6/6-12 VDC	\$1,195.00
1512HO2	1500/1500 A 2-6/6-12 VDC	1,445.00
2012HO2	2000/2000 A 2-6/6-12 VDC	1,795.00
3012HO2	3000/3000 A 2-6/6-12 VDC	2,765.00
1018HO2	1000/1000 A 4-9/9-18 VDC	1,748.00
1518HO2	1500/1500 A 4-9/9-18 VDC	2,150.00
2018HO2	2000/2000 A 4-9/9-18 VDC	2,750.00
724HO2	750/750 A 6-12/12-24 VDC	1,865.00
1024HO2	1000/1000 A 6-12/12-24 VDC	2,095.00
1524HO2	1500/1500 A 6-12/12-24 VDC	2,525.00

MODEL	DATA	PRICE F.O.B. CHICAGO
4012HO2	4000/4000 A 2-6/6-12 VDC	\$3,395.00
5012HO2	5000/5000 A 2-6/6-12 VDC	4,325.00
6012HO2	6000/6000 A 2-6/6-12 VDC	5,065.00
7512HO2	7500/7500 A 2-6/6-12 VDC	6,695.00
3018HO2	3000/3000 A 4-9/9-18 VDC	3,840.00
4018HO2	4000/4000 A 4-9/9-18 VDC	4,875.00
5018HO2	5000/5000 A 4-9/9-18 VDC	5,855.00
2024HO2	2000/2000 A 6-12/12-24 VDC	3,165.00
3024HO2	3000/3000 A 6-12/12-24 VDC	4,665.00
4024HO2	4000/4000 A 6-12/12-24 VDC	6,075.00

A. C. Input—3 phase, 60 cycle, 220 or 440 volts. Specify line voltage when ordering.

Above prices include Built-in Voltage Control,
Magnetic Starters and all required operating accessories.

Clinton Supply Co., RECTIFIER MANUFACTURING DIVISION
110-112 SOUTH CLINTON ST., CHICAGO 6, ILL. • Phone FRanklin 2-3538

World's Largest Manufacturers of **DUAL-O-MATIC** Platers

Another **fine** product made **finer**

with the PARAMOUNT
"Finishing Touch"

"We require that the finish on both our stainless steel and chromium plated valve plungers be held within 7 to 12 microns," says C. B. Hunt & Son, Inc., manufacturers of precision pneumatic and hydraulic pressure valves. "Finish is a vital factor as it affects the seal of the valve. Our experience has proved that Paramount Felt Wheels are best for this buffing operation. We use an extra soft wheel with a white chrome buffing composition to give a fine polish without destroying close tolerances."

Precision finishes with Paramount Felt Wheels save time and money for hundreds of manufacturers, as they will for you. Contact your jobber today.

Paramount
Felt Wheels,
Bobs, Sheet Felt



Bacon Felt Co. 437 West Water St., Taunton, Mass.

49/Circle on Readers' Service Card

**QUALITY
BUFFING COMPOUNDS**

Bar and Liquid

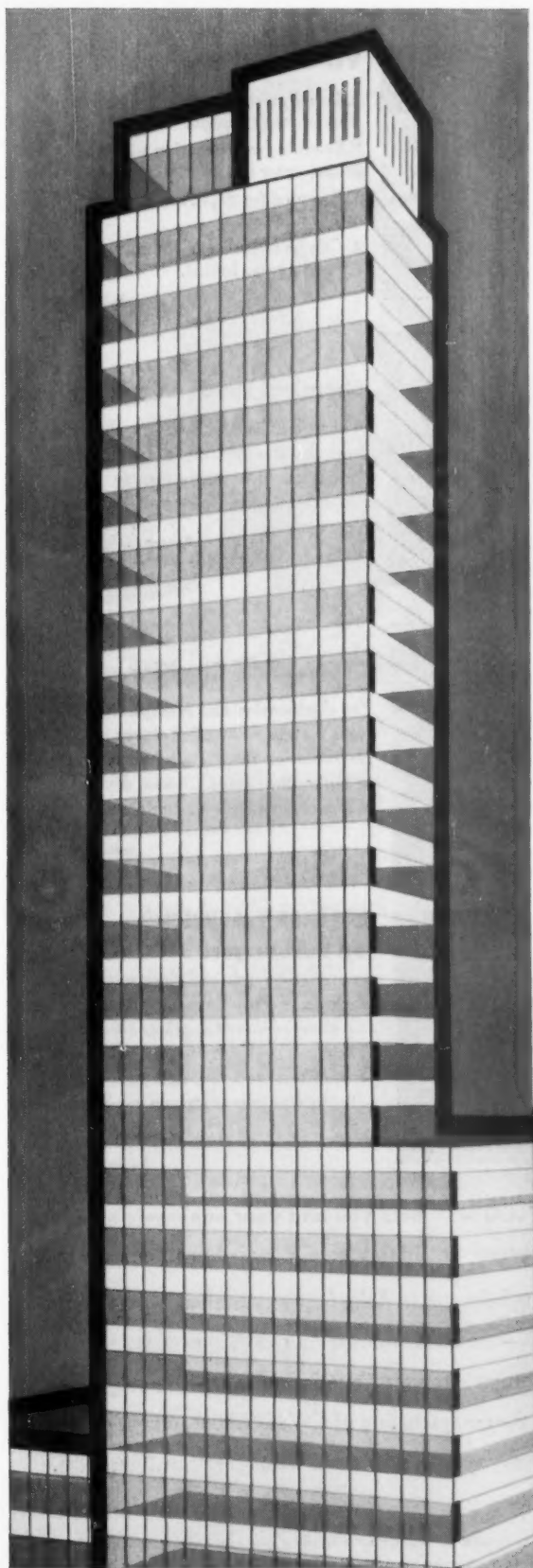


Permacore Air Cooled Buffs

**THE MATCHLESS METAL POLISH CO.
ADVANCE POLISHING WHEELS, INC.**

840 W. 49th Place
Chicago 9, Ill.

726 Bloomfield Ave.
Glen Ridge, N. J.



GOLDEN AGE

FOR ALUMINUM!

**PFIZER OXALATES CAN HELP YOU
ACHIEVE BETTER LIGHT-FASTNESS,
MORE UNIFORM COLORING**

● In the fast-growing field of colored aluminum, you can develop important sales advantages with PFIZER OXALATES.

In making gold colored aluminum, particularly, oxalates will give you improved light-fastness and uniformity. Coloring is accomplished by precipitating iron oxide in the aluminum oxide coating from solutions containing ferric oxalate or ferric ammonium oxalate. Shades, from yellow to brown, can be obtained readily by varying the processing technique.

Why not investigate the big profit potential in producing better colored aluminum through the use of PFIZER OXALATES? Write for further technical information on PFIZER OXALATES.

**Manufacturing Chemists
for over 100 Years**

Pfizer

**CHAS. PFIZER & CO., INC.
Chemical Sales Division
630 Flushing Ave., Brooklyn 6, N. Y.**

Branch Offices:

Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.;
Atlanta, Ga.; Dallas, Texas

Related to this field is Aluminum Company of America
Patent No. 2,290,364, and possibly others.

*For Every Metal
Finishing Waste!*

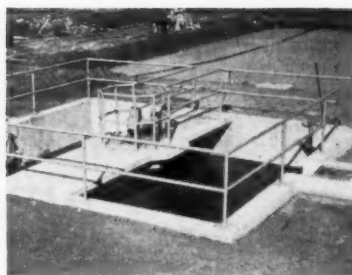
*For Any Degree
of Treatment!*

*And for Chemical and
Water Recovery or
Pollution Abatement!*

INFILCO
Has the Equipment!



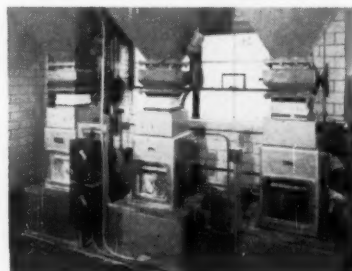
57441



VORTI® Mixers

1. Low Power Consumption due to efficient rotor design.
2. Trouble-free operation with no under water bearings.
3. Adapted for rapid mixing, or flocculation.
4. Can be installed in round, square, or rectangular basins.

Bulletin 700



Chemical Feeders

A complete line for solution, slurry, dry feed, and lime slaking. Adaptable for constant rate operations or proportioning by flow or pH control.

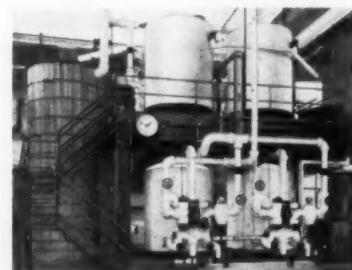
Request Information



CYCLATOR® Clarifier

For clarification and precipitation of toxic metals. Controlled slurry recirculation results in better treatment at higher flow rates. Custom designed skimmers available when needed.

Bulletin 830



CATEXER® ANEXER® Ion Exchangers

recover chemicals and rinse water in many cases. For chromic acid purification and many recovery applications. Each problem is evaluated to determine the economics of recovery operations with the equipment custom engineered for each application.

Bulletin 1960

INFILCO will help you and your engineers evaluate any metal finishing waste disposal problem

Let us help you find the *best* way to meet your particular needs—the one combination of equipment for most economical results. Write for Bulletin 80 to acquaint you with the complete line of INFILCO equipment—
for every type of water and waste treatment problem.

THE ONLY COMPANY impartially offering equipment for ALL types of water and waste processing—coagulation, precipitation, sedimentation, flotation, filtration, ion exchange and biological treatment.



"We are proud of our
QUALITY plating
... made possible by
ROHCO® PRODUCTS!"

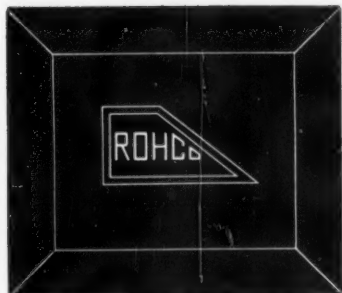
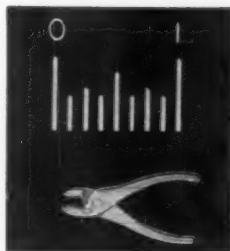
Quality plating has a definite personality . . . in appearance, protection and coverage. But quality plating — that you can be proud of — can only be the planned result of basic quality inherent in the additives and use of reliable testing equipment. It is here that ROHCO PRODUCTS — proven over the years in production tanks — enable thousands of platers to achieve the end results in which they can take pride and more than satisfy their customers.

Remember the words of John Ruskin: "There is hardly anything in the world that some man cannot make a little worse and sell a little cheaper and the people who consider price only are this man's lawful prey."

FREE . . . SAMPLE PLATED PART

This novelty miniature 1 1/8" long pliers has been zinc plated with the addition of ROHCO 503 ZINC BRIGHTENER.

ZINC BRIGHTENERS
•
XL CADMIUM BRIGHTENERS
•
CHROMATE CONVERSION
COATINGS
•
AND OTHER
SPECIAL PURPOSE
PRODUCTS FOR PLATING

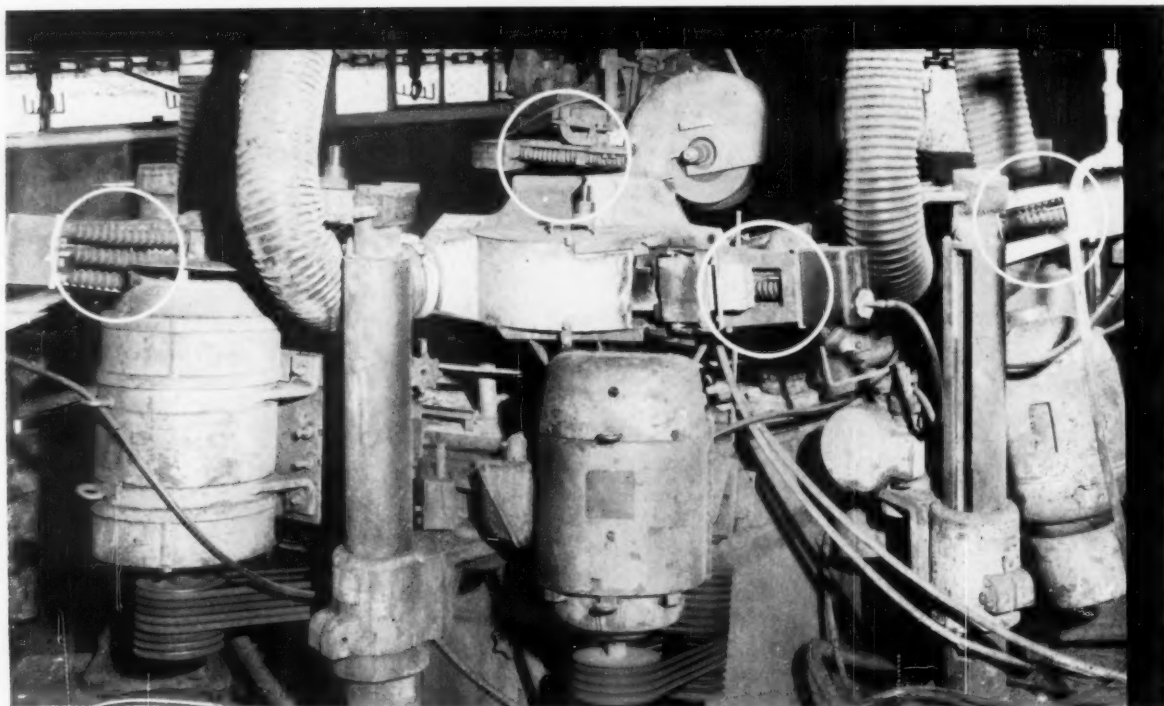


*Write for information you desire and
Free Sample Plated Part, TODAY!*

R. O. HULL & COMPANY, INC.

1301 PARSONS COURT

ROCKY RIVER 16, OHIO



How Trim Manufacturer Cut Compound Costs in Half . . .

A prominent Detroit automotive manufacturer recently installed several Nankervis Automatic Compound Applicators for a trial period on one of their automatic trim buffing lines. After running an extensive series of tests — both on quality and quantity — they came up with these amazing results:

	SPRAY	BAR
COMPOUND USED	105 pounds	107 pounds
COMPOUND COST	\$183.74 (.17½ x 105)	\$176.55 (.16½ x 107)
NO. OF PIECES BUFFED	12,600 *	32,000
COST PER PIECE	\$.0145 each	\$.0055 each

Bar compound, automatically applied, doubled the number of pieces that could

be buffed with the same amount of compound, cutting costs in half! Too good to be true? Conditions too ideal? Maybe. But the proof lies in the fact that now all their automatics use bar compound and Nankervis Applicators — saving dollars every minute of operation.

Sound interesting?

If it does, then why don't you too arrange for a trial in your plant. It won't cost you a cent. You conduct the test and you be the judge.

Write today for information about a trial in your plant. *George L. Nankervis Company, 15300 Fullerton Avenue, Detroit 27, Michigan.*

GEORGE L. NANKERVIS COMPANY

Equipment and Supplies for the Metal Finishing Industry

LEA and LEA-RONAL for

BURRING • BUFFING • LAPPING • POLISHING • PLATING

SATIN FINISHING • STRIPPING • ANALYZING

**INDUSTRY'S
SHOPPING CENTER
for PLATING and SURFACE
FINISHING PRODUCTS
and TECHNICAL
SERVICE**

*...Here's your supermarket for
industrial abrasive compositions,
electrochemical processes,
polishing wheel and
belt cements, wetting agents,
finishing compounds*



THE **LEA** MANUFACTURING CO.
16 Cherry Avenue, Waterbury 20, Conn.

Lea-Michigan, Inc., 14000 Waterbury Ave., Detroit 27, Mich.

Lea Mfg. Company of Canada, Ltd.,

1236 Richmond Road, Scarborough, Ontario, Canada

Lea Mfg. Company of England, Ltd., Boston, England

Lea-Ronal, Inc., Main Office and Laboratory:

129-20 109th Ave., Jamaica 35, N. Y.

Manufacturing Plant: 237 East Aurora St., Waterbury 20, Conn.




Lea-Ronal Inc.

Sales and Manufacturing Plant:
237 East Aurora Street, Waterbury 20, Conn.

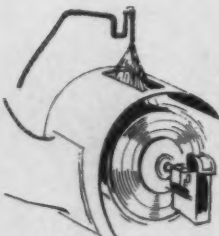
Main office and Laboratory:
129-20 109th Avenue, Jamaica 35, N. Y.




Complete testing and manufacturing facilities to help YOU solve your production line problems in **BUFFING • POLISHING • BURNING** **LAPPING • SATIN FINISHING**




LEA COMPOUND . . . industry's pioneering greaseless composition for burring, buffing, satin finishing, and flexible polishing; contains abrasives ranging from sharp, fast-cutting grits to fine, soft powders for delicate finishes.



LEA LIQUABRADE . . . clean-working, fast-cutting and mirror-finishing liquid buffing compound, providing in effect continuous operations and substantial economies in compositions and buffs; clean and safe, non-flammable, non-explosive; many abrasive types and grain sizes for all non-ferrous metals, steel, stainless alloys, and plastics.



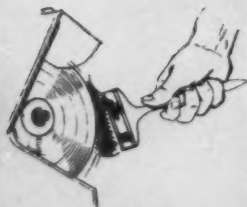
LEAROK . . . compositions with "no free grease" designed primarily for buffing or coloring pieces which involve cleaning difficulties; does not pack up in recesses and ornamentations.



LEA GRIPMASTER . . . high bonding strength cement for polishing wheels and belts; used in setting up longer lasting polishing wheels and belts for both ferrous and non-ferrous metals.


AD-LEA-SIVE . . . glue-base adhesive for sizing, buffing and polishing wheels prior to application of Lea Compound, Leabrasive or other loose abrasives; available in bar form or bulk.

LEA LAPPING PASTE . . . micron size controlled abrasive paste for accurate and fine surface finishing.



LEABRAMENT . . . greaseless, non-flammable, quick-drying, liquid abrasive for burring and polishing; can be sprayed or brushed on wheels.

LEA LIQUALUBE . . . water soluble liquid lubricant for polishing wheels and belts; can be sprayed or brushed on.



LEA LUBAR . . . bar form lubricant for polishing wheels and belts where glazing is not a problem.

cleAn GRAIN LUBAR . . . special bar form lubricant to eliminate glazing on polishing wheels and belts.

LEA COLDSTRIP . . . a room temperature, non-toxic stripper for synthetic enamels; requires minimum ventilation; can be filtered for continuous use.

LEA SYNSTRIP . . . a fast working, non-corroding liquid stripper for enamel, lacquer and synthetic coatings; will not attack base metal or alloy; does not dissolve the coating but breaks the bond. Heating permits alkyd, epoxy, phenolic silicone and urea coatings to be stripped in seconds.

LEATARDENT . . . anti-stain dip emulsion; prevents staining and tarnishing of plated surfaces.

LEA PLASTI-BRADE . . . a flexible liquid abrasive polishing composition carrying the finer grit sizes.

LEA PLASTI-GLUE . . . a flexible liquid adhesive for setting up polishing wheels.

LEA KROMSAVERS . . . inert plastic rods and floating tubes . . . mist preventive for chrome and other plating solutions.

LEA LECTROMAG . . . portable electrical instrument for measuring the thickness of non-magnetic coatings on carbon steel and iron.

LEA ANALYTICAL METHODS . . . plater's short cut methods for analyzing plating solutions.

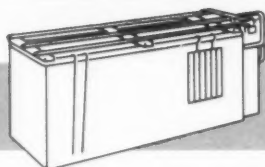
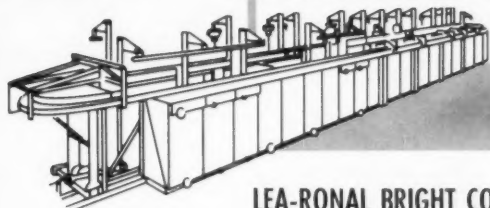
LEA COPPER-GLO tolerant to contaminants while consistently producing a high speed, buffable, bright plate.

LEA SPRAY GUN MOVER . . . air-actuated machine for mounting automatic spray gun; sprays liquid buffing compositions uniformly on wide face buffing wheels.

LEA BUFF RAKE AND EVENER . . . a sturdy "two handy tools in one" for raking and evening of buff wheels without tearing the buff face, breaking threads or leaving jagged, rough or uneven surfaces.



Tested BRIGHT PLATING PROCESSES, ADDITIVES and SPECIALTIES developed by electrochemists to exacting standards. Product and Process hand in hand from one source of supply.



LEA-RONAL BRIGHT COPPER . . . tolerant to contaminants while consistently producing a high speed, buffable, bright plate through the use of Lea Copper-Glo.

particularly Lea-Ronal baths . . . produces smooth deposits and excellent anode corrosion. Better and more economical than Rochelle Salts.

LEA-RONAL BRIGHT ACID COPPER using Copper Gleam . . . exceptional leveling action, excellent buffability, exceptionally stable.

ULTRATARTRAL . . . superior addition agent for cyanide copper baths permitting exceptionally high current densities, wider range in free cyanide, use of sodium cyanide; tolerant to carbonates, easy to control.

LEA-RONAL CUPROTYPE ACID COPPER . . . an acid-copper Plating Process designed for electroforming and electrotyping. Producing smooth, ductile, tree-free, heavy deposits at high speed.

CUPRALL . . . cyanide copper addition agent producing high speed buffable copper deposits where brilliance is not required.

LEA-RONAL BRIGHT HIGH SPEED BRASS using Brass-Glo . . . uniform, lustrous deposit over a wide current density range.

WATERSHED . . . liquid rinse aid which promotes free rinsing and fast drying, hence reduces staining and spotting of plated pieces.

LEA-RONAL BRIGHT NICKEL using Nickel Gleam . . . extremely ductile deposit, exceptional leveling characteristics, high throwing and covering power.

WETTING AGENTS CW-6 and CW-7 . . . addition agents for all cyanide copper plating baths, particularly Lea-Ronal. Benefits anode corrosion; increases tolerance to organic contamination.

LEA-RONAL BRIGHT SILVER using Silver-Glo . . . industrial or decorative. Rapid deposition, harder deposits, high tarnish resistance.

TST PURIFIER . . . brings about remarkable increase in tolerance to chromium and zinc in cyanide copper baths, particularly when used in conjunction with Supertartaral or Ultratartaral.

LEA-RONAL BRIGHT GOLD using Golden-Glo . . . industrial or decorative. Produces a smooth, bright ductile deposit with excellent wear resistance.

LEA NICKEL-GLO . . . a "no-sludge" addition agent for barrel nickel plating solutions, producing bright plated surfaces and fine deposits of metal; possible to eliminate burnishing of small articles.

LEA-RONAL BRIGHT CADMIUM . . . produces bright protective cadmium electrodeposit for use on both ferrous and non-ferrous metals.

LEA MIRRO-GLO . . . similar to Nickel-Glo in effect but for still tank nickel plating.

LEA-RONAL BRIGHT ZINC . . . a bright zinc for barrel and still operation. Stable brighteners have long staying power.

RONAL EZ KLEEN FILTER . . . a different type filter operating on a vacuum principle. Crystal clear filtrate, flexible fast cleaning, simple to operate, economical.

SUPERTARTARAL . . . exceptionally effective addition agent for cyanide copper baths,

CUSTOMERS

Here are reproductions of some of our recent advertisements. If it's **FINISHING**, come to us.

SERVICE

Our laboratories in Jamaica, New York, Waterbury, Connecticut, and Detroit, Michigan, and our field engineers are always **ON CALL**. Lea is **FINISHING HEADQUARTERS** for literally hundreds of manufacturers... we would like to tackle your **Plating or Finishing Problems**. Write or call... we're ready to help you cut your costs and get a better finish.

THE LEA MANUFACTURING CO.

16 Cherry Avenue, Waterbury 20, Conn.

Phone: Plaza 3-5116

Cable Address: LEACO

LEA-MICHIGAN, INC.

14066 Stensbury Avenue, Detroit 27, Michigan

Phone: Broadway 3-3400

LEA MFG. COMPANY OF ENGLAND, LTD.

Suxton, England

Phone: Suxton 223

LEA MFG. COMPANY OF CANADA, LTD.

1236 Birchmount Road, Scarborough, Ontario, Canada

Phone: Plymouth 74164

LEA-RONAL, INC.

Main Office and Laboratory:

139-20 109th Avenue, Jamaica 26, New York

Phone: Jamaica 1-8770

Manufacturing Plant:

237 East Aurora Street, Waterbury 20, Conn.



Now! An alkaline rust and smut remover that really works!

NEW WYANDOTTE FERLON

Simple to use, foolproof in action . . . eliminates metal etching and hydrogen embrittlement . . . combines several operations into one

Here's another new member of Wyandotte's complete line of advanced, top-quality metal-finishing products: Wyandotte FERLON! It's a versatile, fast-acting alkaline rust and smut remover—for use with or without current—that wins hands down over all other similar products in treating steel!

Here's what FERLON will do:

- **REMOVES RUST AND OXIDES** from steels, including stainless steels, without injury to sound metal. May be used as a simple immersion for light rust, or with current for heavy rust and some scales.
- **REMOVES WEATHER, HEAT, AND CHEMICAL STAINS** from steel, bronze, and copper alloys. Usually a simple dip is all that is required.
- **REMOVES SMUT.** FERLON may be added to steel electrocleaners for improved smut removal. Insures brighter electroplates, reduces roughness.
- **SHORTENS PLATING CYCLES.** FERLON eliminates the acid dip in some plating cycles—shortens cycle up to 30%.
- **REMOVES PHOSPHATE COATINGS AND PAINT** in the same tank with rust, scale, and smut, if desired.
- **ADAPTABLE** for soak tank or electrolytic use in existing equipment.

FERLON represents a big step forward in the metal-finishing industry. Chances are its versatility will shorten your production operations and save you money. Contact your nearest Wyandotte representative for a demonstration today. Or clip and mail coupon. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California. Offices in principal cities.*



J. B. FORD DIVISION

The Best in Chemical Products for Metal Finishing

**See you in Cincinnati — A. E. S. Convention
May 19-22 — Sheraton-Gibson Hotel**

**Wyandotte Chemicals Corporation
Wyandotte, Michigan**

- ☐ Please send latest FERLON data sheet
☐ Have representative call

Name _____

Firm _____

Address _____

City _____ Zone _____ State _____



Have you heard about the
Big Switch on copper anodes
at the Monroe Bumper Plant?"

—and NO BUFFING... I
understand that Livonia
is doing the same."

"That's for sure, Jack... for the past two years Hank's been
using our Rolled 2" Round Phosphor-Brite Copper at the
Fort Street Plant and these startling results were obtained..."

- No "Bagging"—No Diaphragms
- Practically Eliminates sludge and copper build-up
- Smoother and Denser Deposits with Minimum Treeing
- Better Anode Corrosion than ever before
- Faster Deposition for constant amount of current
- Reduction in acid replacement and additives



The New Univertical
"PHOSPHOR-BRITE"
Rolled Copper Anode
for Acid Baths in the
Electrotyping, Electro-
plating and Electro-
forming Industries.

Virgin Metals
Used Exclusively



UNIVERTICAL
FOUNDRY AND MACHINE COMPANY

14841 Meyers Rd. B.Roadway 3-2000 Detroit 27, Michigan

Producers of Rolled—Cast and Forged High Purity Anodes
Nickel—Copper—Zinc—Tin—Lead—Cadmium and Brass

Since
1939

55/Circle on Readers' Service Card



Why TRERICE Temperature Control

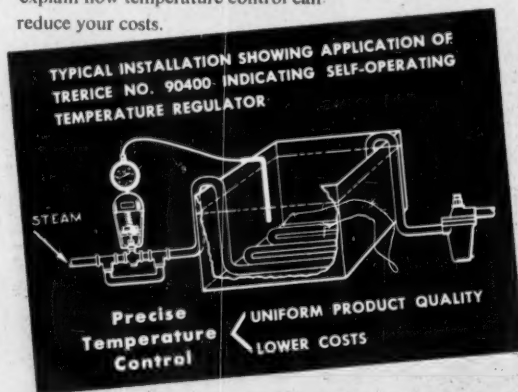
... in Plating
and Metal Finishing Operations?

WHY temperature control? First of all, to assure uni-
form quality; second, to reduce processing costs.

Maintaining bath temperatures at the *one best level* used to
be a serious problem. But not anymore. Today, TRERICE
controls are automating plating processes throughout the
metal finishing industry... maintaining precise tempera-
tures *automatically*—TRERICE regulators prevent evapo-
ration losses, cut down on rejects, insure uniform product
quality! You save time, labor and fuel costs. Not surprising,
then, that TRERICE controls are standard with leading
original equipment manufacturers. Behind this wide accept-
ance is the TRERICE reputation for quality, and a nation-
wide sales and service organization.

The TRERICE line is a *complete* line. Each TRERICE
temperature control installation is set up to meet the specific
requirements of the user, insuring uniform product quality
at the lowest cost.

If your operation involves cadmium, chromium, copper,
nickel, tin or zinc plating; anodizing, bonderizing, cleaning,
pickling or rinsing, it will pay you to have a "Trerice Man"
explain how temperature control can
reduce your costs.



Send Today for Bulletin 803—TRERICE TEMPERA-
TURE CONTROLS for the Metal Finishing Industries

H. O. TRERICE CO. 1424 W. Lafayette Blvd., Detroit 16, Mich.
Factory representatives in principal cities of U.S. and Canada

56/Circle on Readers' Service Card

NEW — from Davies®

Patent Applied For

THE **UNI-BOLT** ELECTRODE ROD INSULATOR

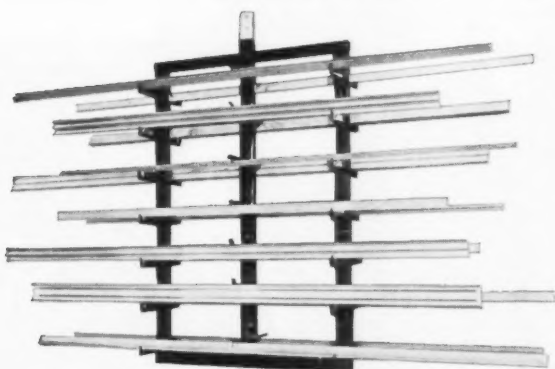
ONE-PIECE CONSTRUCTION • SINGLE BOLT

- Simple — easy to install
- Automatic Insulation — no spacer required
- For alkaline, acid and oxidizing solutions
- HIGH impact resistance
- Resistant to liquid absorption
- Long-lasting heavy steel construction
- Stainless steel bolt
- Heavy plastisol coating



Available direct or
through authorized distributors

FOR LONGER LIFE AT LESS COST — Davies
Titanium-Tipped Anodizing Racks



Substantial savings are now possible with these durable, corrosion-resistant anodizing racks, titanium-tipped at slight extra cost, and custom made to your specifications. These same racks were featured recently in the editorial pages of several national trade publications.

Photo above shows one model rack before plastisol coating. Titanium tips, though constituting a small percentage of the total rack area, extend service life of the rack considerably. One user, in three months, saved nine times the additional cost of the titanium tips, by completely eliminating the need for repairs during that period.

Write today for complete information on Davies titanium-tipped anodizing racks and ENGINEERED racks for all types of plating

Southwest Sales and Service Representatives for these Leading Plating Equipment Manufacturers:

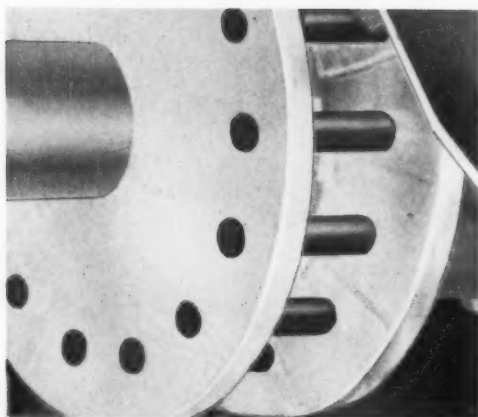
DALLAS 1, TEX.
301 N. Market St.
Riverside 7-5423

KANSAS CITY 8, MO.
813 W. 17th St.
BAltimore 1-2128

4160 Meramec St. • MOklow 4-9332 • ST. LOUIS 16

The Udylite Corporation
Frederic B. Stevens, Inc.
MacDermid, Inc.
Allied Research Products (Iridite)
Roto-Finish Co.
Circo Equipment Co.

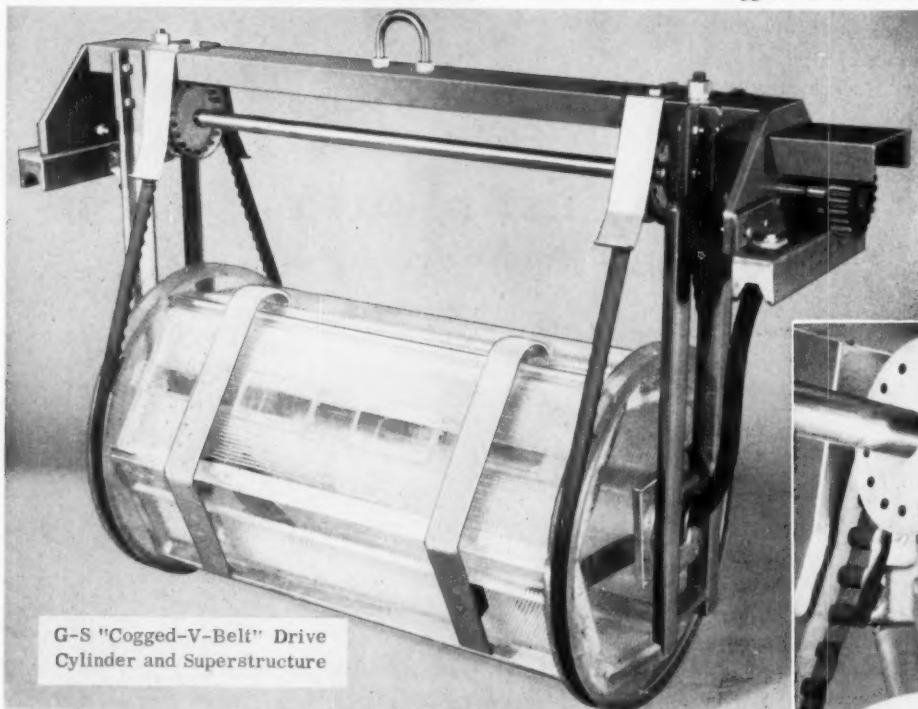
Clecco Heaters
Joe-D Buff Co.
Kocour Co.
Pressure Blast Equipment Co.
Unit Process Assemblies
... and many others



another **NEW** reason why... **G-S means Greater Savings**

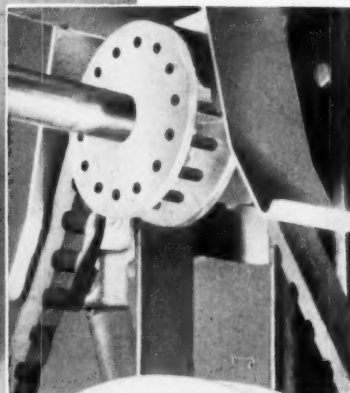
Drive-pulley cog-pins of tough "Polydur"!

Exclusive with G-S! Polydur is a recent development of G-S Plastics. This amazing new material combines for the first time, all the essential characteristics for these most vital small parts in the famous G-S "Cogged-V-Belt" Drive. In this application, Polydur outperforms all other plastics and metals, including Stainless and Monel. Polydur is a "natural" — tougher, longer lasting, practically indestructible; chemically resistant to solutions, yet self-lubricating, virtually eliminating friction-wear. A usual trouble point in other makes of belt-driven barrels, these cog-pins of Polydur are one of the strongest features in the G-S "Cogged-V-Belt" Drive.



G-S "Cogged-V-Belt" Drive
Cylinder and Superstructure

G-S **"Cogged** **V-Belt"** **Drive**



"The Belt-Drive with the Gear-Grip" Saves 100% Gear Maintenance.

Eliminates: cylinder-end drive gear, idler gear, pinion gear, 3 bearings. No gears or bearings in solution.

G-S Gives You More Exclusive Features

- ★ **G-S cogged V-belt and cogged drive-pulley.** (U. S. Pat. 2,562,084), constant meshed for positive power transmission without gears. Can't slip, creep, vary speed. Cogged-V-Belts finest in field; chemically resistant Neoprene with non-stretch steel tensile members, double Nylon protective envelope; cogged by special machinery exclusive with G-S. Polydur cog-pins outperform, outlast all others (see above).
- ★ **Floating End Plates** for constant contact of inverted V-blocks. Can't rock in saddles. More contact.
- ★ **Longer Inverted-V-Contacts** offer 16" more contact area, up to 30% greater current flow per load.
- ★ **Automatic Positioning** — Guide channel directs superstructure into operating position, quicker, easier.

- ★ **Adjustable Bearings** support drive shaft — maintain constant-mesh with motor drives at all times.
- ★ **Floating Hubs** with danglers angled downward for constant cathodic contact in center of load. Won't "ride" up on top of load.
- ★ **Heavier Dangler Cables** for higher current carrying capacity, longer life, better operation.
- ★ **Faster Dangler Cleaning** — Slide out hub-lock: 10 secs. Interchange cyls: 5 mins. Cuts hours off usual time.
- ★ **Total Cylinder Immersion** — Prevents gas pockets. Increases current density. Eliminates danger of explosions. Bigger loads, faster plating.
- ★ **Rugged, All-Welded Cylinders** — "H-T Sincalite" or "Tempron" Hard Rubber. Heavy-duty, 2" ribs. No "formed" or "molded" sections. Longer

life. Best for complete cycles, temps. to 200°F. New, Self-Adjusting Door Clamps, spring-looped at one end for constant tension; can't slip or loosen. New, "T" Door Handles for 2-handed grip; safer, easier handling. Welded on center, full-length, reinforcing door rib.

★ **Many More Features** — Also available with horn-type contacts (3-point suspension with 4-point contacts. No shorts from burned-out insulation and arcing). Single-Screw Adjustable Motor Mount on tank raises and lowers motor drive to mesh with superstructure gear. Get all the facts! Investigate the new, low-cost G-S Conversion Plan for your plant. It pays for itself in maintenance savings alone. Write today.

The G. S. Equipment Co.

15583 Brookpark Rd. Cleveland 11, Ohio
Clearwater 2-4770

ABBEY-Matic

Rack Anodizing System

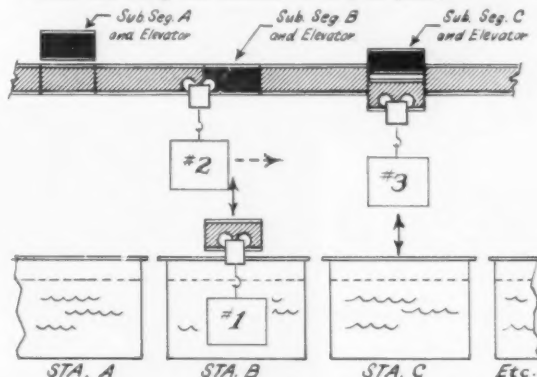
Challenges All Comparison

Now you can combine "cell" type processing with "drag-through" in the same automatic machine — with ABBEY-Matic.

"Batch" Anodizing Goes Automatic. Here's another example where ABBEY-Matic's unequalled flexibility for adapting to preferred process methods pays off big. Visualize your own application of this system. The flow chart represents a typical ABBEY-Matic Rack Anodizing plan. No need to accept "drag-through" anodizing as a compromise. Notice the station elevators at each anodizing "cell." ABBEY-Matic's exclusive "leap-frog" principle (U. S. Pats. Pending) provides for the ideal method of automatic current increase as part of a *fully automatic function*; thus compensating for different alloys or work loads in different cells.

"Drag-Through" As You Wish. ABBEY-Matic flexibility also provides for an automatic switch-over to "drag-through" processing where desired (Hot Water Seal section). Which-ever method is preferred, ABBEY-Matic readily adapts to it for utmost quality, efficiency and economy. When a conventional "automatic" system restricts or limits any phase of processing due to its mechanical shortcomings, it isn't *true automation*. ABBEY-Matic conforms to your requirements in detail, provides *complete automation for optimum results*; minimizing liabilities of manual operations and extra equipment to degrees never before possible.

ABBEY-Matic Cuts Costs — does the job with less equipment; eliminates skilled manhours. Movements and timing are predetermined, and actuated by simple, failproof electro-mechanical devices. Carriers can be selected and transferred at random for any station. Processing time for different loads is allotted individually, can be varied station-to-station by separate timer controls. Only ABBEY-Matic *non-synchronized* carrier and station impulse-memory signaling and control make *full automation* possible. Learn how ABBEY-Matic can bring full automation to your plant.



ABBEY-Matic Unique "Missing Link" Operation. All carriers have by-passed Sta. A. Main track segment in place. Carrier #1 was lowered by Sta. B elevator on main track segment into process, while substitute segment in main track allows carrier #2 to "leap-frog" carrier #1. Sta. C elevator and track segment are lowering carrier #3 into process, allowing substitute segment to fill gap in main track.

ABBEY-Matic Rack Anodizing System

Sta. Cycle

- 1 Soak Clean
- 2 Soak Clean
- 3 Cold Rinse
- 4 Soak
- 5 Cold Rinse
- 6 Deoxidize
- 7 Cold Rinse

- 8 Bright Dip
- 9 Warm Rinse
- 10 Cold Rinse
- 11 Anodize
- 12 Anodize
- 13 Anodize
- 14 Anodize
- 15 Anodize
- 16 Cold Rinse
- 17 Neutralize
- 18 Cold Rinse
- 19 Dye "A"

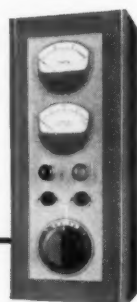
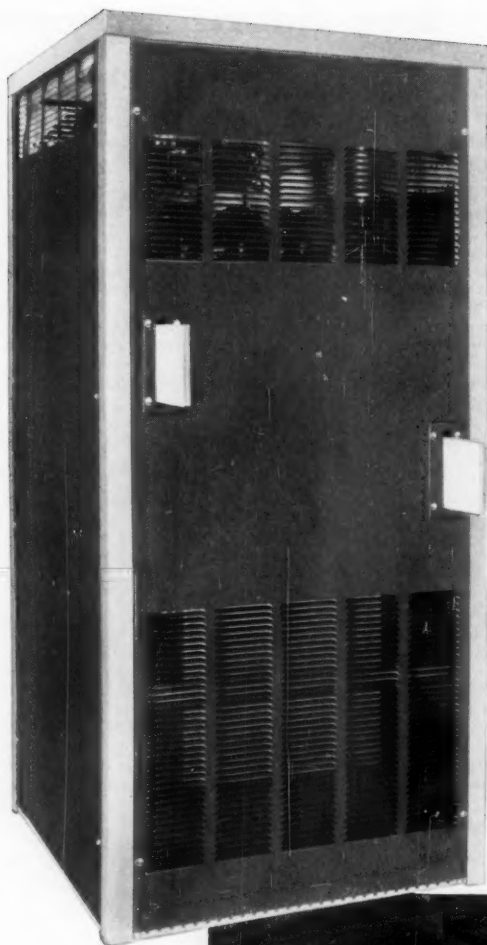
- 20 Cold Rinse
- 21 Dye "B"
- 22 Cold Rinse
- 23 Ni Acetate
- 24 Cold Rinse
- 25 Hot Water Seal
- 26 Hot Water Seal
- 27 Hot Water Seal
- 28 Hot Water Seal
- 29 Hot Water Seal
- 30 Unload
- 31 Load

ABBEY
PROCESS
AUTOMATION
INC.

37-01 48th Ave., Long Island City 1, N. Y.
RAVENSWOOD 9-0592

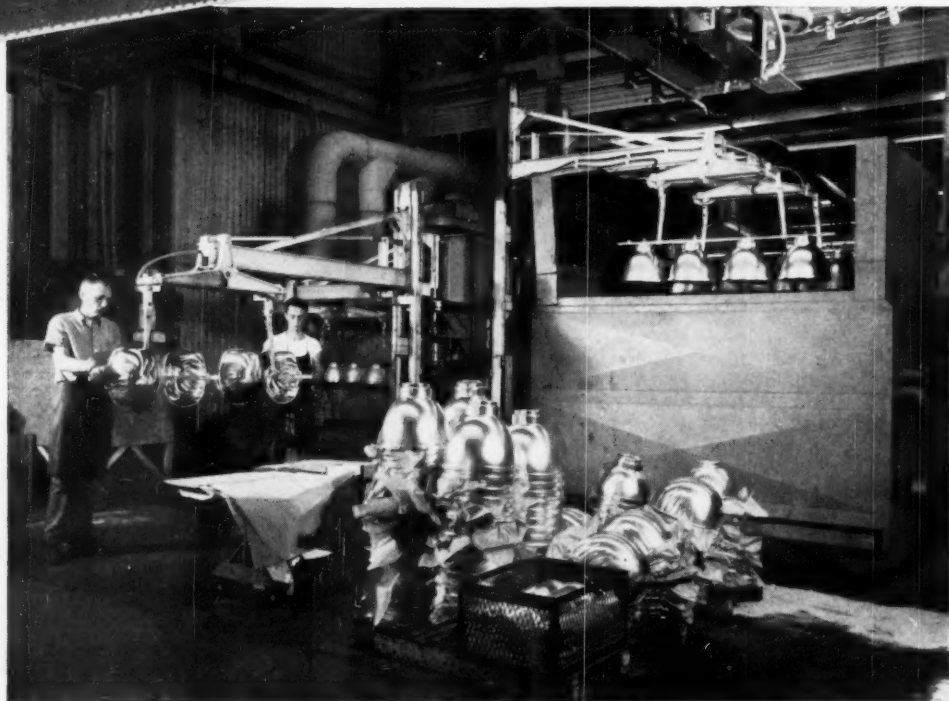
Eastern Representative: Comco, Inc., Div. Enthone, Inc.
442 Elm Street, New Haven, Conn.
Midwest Representative: The G. S. Equipment Co.
15385 Brookpark Road, Cleveland 11, Ohio
Canada Representative: Armalite Co., Ltd.
Crystal Arts Square, Toronto 6, Canada

HERE'S NEWS FROM **SILICON** WITH AUTOMATIC



IN A SMALL REMOTE CONTROL station you can now have any of these features of the new General Electric silicon plating rectifier: automatic current density, constant current, constant voltage, and automatic anodizing.

ATTENTION ALL ANODIZERS: avoid costly rework and save labor with automatic current density or automatic anodizing cycle control. If you color-anodize, this control will save you money with more consistent results.



GENERAL ELECTRIC!

PLATING RECTIFIERS

CURRENT DENSITY CONTROL ... AT NO ADDITIONAL COST!*

Check these benefits you can get with the *new* General Electric silicon plating rectifier!

- Silicon cells, conservatively applied to protect against damaging d-c overloads. The new G-E plating rectifier can withstand current surges far above continuous rating—without cell failure!
- With silicon equipment you can operate at higher ambient temperature (up to 113°F) than ever before—*without any derating!*

BUT, BY FAR THE BEST NEWS

is the Automatic Current Density Control! Now, for the first time, General Electric offers an automatic current density control *at a price any plater can afford.** Once you have tried this control you will not

want to be without it! Now you can have just the proper voltage and current, whether you run one lightly loaded rack or eight fully loaded racks.

General Electric has been making large installations of Automatic Current Density Control since 1953. The success of this type control has been proved. While *absolute* constant current density control can be realized only with constant work area and constant current control, the new G-E control will serve as a close approximation in most cases.

How does Automatic Current Density Control work? Basically, a current signal is taken from the rectifier output and used to adjust the output voltage to compensate for various sizes of light loads. But for full details, send in the coupon below **TODAY!**

*Examples: 1 1/2 to 9 volts, 1500 amperes, only \$1890; 4 to 24 volts, 2000 amperes, only \$4600. Prices include automatic current density control and remote control box.

Progress Is Our Most Important Product

GENERAL ELECTRIC

TO: MR. J. E. MUNGENAST, Sec. A462-17
Rectifier Department, General Electric Company
Lynchburg, Virginia

Please send me more information—including prices—on the new General Electric silicon plating rectifier with Automatic Current Density Control.

Name _____

Company _____

Address _____

City _____ Zone _____ State _____

☐ I DO ANODIZING. Please send me information on anodizing control.



Now We Would

COMPRISING THE PRESENT FULL LINE OF—

MILLIKEN FABRICS for BUFFS

Giving the best buff cost/performance ratios

In a sense you have been to a series of Masquerade Parties attended by two of our four Belles: Type 190 and Type 160. Millions of yards of these two top fabrics have been delivered to buff manufacturers... and in all probability are in some of the buffs you are using in your shop today. But until now there has been no identification of these fabrics.

Now, the time has come to tell you of our 'behind the scenes' service... to remove our masks, so to speak, and introduce our fabrics so you will know their names, their performance values and their trademarks.

At the right are brief descriptions of our present line of four different Milliken Fabrics. Each fabric has been woven and specially processed to meet one or more broad buffing requirements. The appropriate trademark will be printed on each yard of fabric

so that you can identify the cloth used in each section as buffs come into your plant.

Because our cloths have had no identifying marks in the past and because each of these four Milliken Fabrics has different buffing characteristics, we suggest that you test out all four. Ask your buff supplier to make up some buffs of the proper type and size so that you can test them in your own shop on your own production. This will not only bring you up to date on relative values but enable you to try out the two cloths not familiar to you... Redline and Wearon. Once the cloth with the best buff cost/performance ratio for your production has been established, then stay with the identified fabric: Type 190, Type 160, Redline or Wearon. Specify it each time you order buffs. The printed trademark is your guarantee that you are getting the quality fabric you want.



Like to Introduce Ourselves

Type 190
FABRIC ENGINEERED by Milliken

Today the most widely used cloth in buffing. Engineered by Milliken Research for "cut and color" work, type 190 has become the industry standard — the work horse of every buffing shop.

Type 160
FABRIC ENGINEERED by Milliken

A companion to type 190 where industry needs a softer fabric— for those jobs between "cut and color" and fine coloring work.

Redline
FABRIC ENGINEERED by Milliken

A recent addition to the family, REDLINE was engineered to meet the need for heavier work, particularly where emphasis is on metal removal.

Wearon
FABRIC ENGINEERED by Milliken

A real solution to the tough jobs, particularly where "raking" is involved. Developed through four years of intensive research and fully field tested, WEARON has been added to the line to meet the unusual problem. WEARON gears itself to the job. It heads up more quickly than other fabrics, requires less compound and resists fraying and tearing. It is particularly durable in cutting down flashings and fins and in buffing irregular shapes.

→ **DEERING, MILLIKEN & Co. Inc.**

1045 SIXTH AVENUE • NEW YORK 18, N. Y.

ELECTRO POLISH

production pieces
faster—better with

Electro-Glo
SOLUTIONS

- Polishes—Deburs—Levels
- Saves Time—Labor Costs
- Improves Product Appearance
- Sold as a Concentrate
- Used with Standard Plating Equipment

Electro-Glo electropolishing is the modern, economical finishing method in which a fractional amount of metal is removed rather than deposited as in plating. Electro-Glo comes to you as a concentrate, and you purchase the balance of the solution locally. It is used in conventional plating equipment.

Electro-Glo does a multiple job. Deburring, leveling, and polishing take place simultaneously. Any degree of brightness is easily obtained. Electro-Glo concentrates process Copper Alloys, Stainless Steel, Carbon Steel, and less common metals and alloys. The Electro-Glo process is recognized as a superior polishing method, and has an enviable record for Saving Time, Saving Labor, Increasing Production . . . and NO royalties!

FREE SERVICES

Engineering service available. Sample piece electropolished by the Electro-Glo method without charge. Equipment layout and cost analysis furnished. Special methods and finishes developed. Send for full details.

Electro-Glo CO.
1428 South Talman Avenue Chicago 8, Ill.

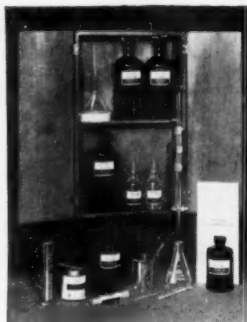
62/Circle on Readers' Service Card

Insure continuous "trouble free" plating with KOCOUR TEST SETS

. . . . They're easy to use

Kocour Test Sets utilize the most direct methods of analysis. They're designed for the man with "no knowledge of chemistry." Directions are written in a step by step form . . . readings are usually directly in ounces per gallon . . . calculations are minimized.

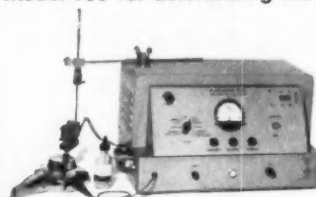
. . . . For every plating purpose



Kocour Test Sets are available individually or in economical combinations for the control of plating, cleaning, pickling, anodizing, sealing, coating, passivating, desmutting, deburring, phosphorizing, heat treating and pH control. Write for your free copy of "Lab Hints for the Plater."

KOCOUR ELECTRONIC THICKNESS TESTER

Model 955 for determining the thickness of plating.



90-95% accurate
direct readings
simple operation
virtually automatic

Model 955 determines the thickness of heavy or decorative chromium, silver, tin, cadmium, zinc, brass, copper, nickel, lead and other alloy deposits on various basis metals. Write for descriptive Bulletin 400 . . . and ask for a demonstration or 15-day Free Trial.

• KOCOUR testing sets are used all over the world for controlling plating — cleaning — pickling — anodizing — and hardening processes . . . special sets can be provided for your requirements.
Write today for complete information — no cost or obligation.

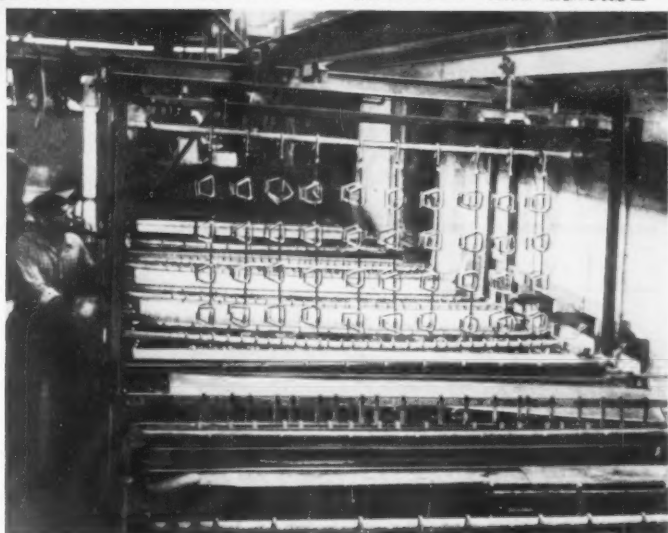
KOCOUR COMPANY
4802 S. ST. LOUIS AVENUE
CHICAGO 32, ILLINOIS
Specify KOCOUR test sets from your supplier.

63/Circle on Readers' Service Card

Why only ONE rack?..... When you can handle TEN!



**Job Shop Versatility
with
Automatic Productivity**



1/3 Labor of Hand Plating

Plates Any Finish in Any Sequence

Any Size Work at Any Time

Time in Tanks Independently Variable

Any Tank May Be By-Passed at Any Time

Any Length, Width or Depth Tank

Saves Floor Space, Low Headroom

Only 25% More Investment Than Hand

Saves Material, Controlled Withdrawal

Better Control, Cleaner, Drier

Work Bar Carries Work Through Process

Work Bar Does Not Block Removal or Placing of Work in Tank

Air Operated Hoist is Easily Controlled

Completed Work Easily Transferred to Monorail Conveyor for Unracking and Reracking

PHOTO SHOWS JOBBING SHOP WITH 3 MEN PROCESSING 9' 0" WORK BARS THROUGH 21 TANKS HANDLING 250 RACKS PER HOUR.

**SOLBERN
MANUFACTURING
CORPORATION**

Division of Eisenberg Industrial Contracting Co.

120 - 13th STREET, BROOKLYN 15, N. Y.

Phone Hyacinth 9-7700

Rhodium

ELECTROPLATING SOLUTIONS

Backed by 57 Years of Specialization

Technological knowledge acquired through many years of experience, plus special processes and equipment, assure the high quality of our Rhodium Plating Solutions.

Recommended for contact surfaces of switches, waveguide parts and other electrical applications, such as printed circuits...Can be applied in extremely heavy deposits, up to 100 milligrams per square inch.

Rhodium plating provides the advantages of whiteness, lustre and corrosion resistance of a precious metal.

Write for new informative booklet "The General Properties of Rhodium" sent without charge... Consult our staff about your plating problems.



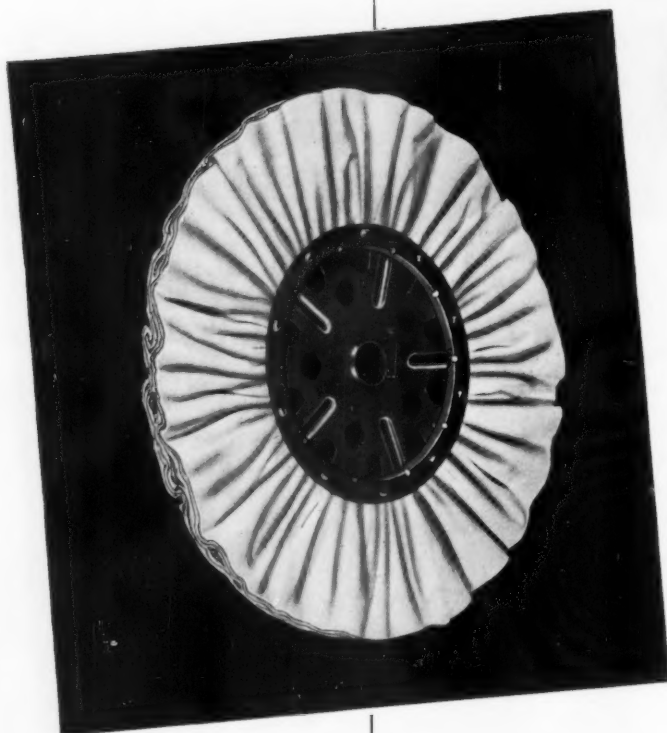
Since 1901



SIGMUND COHN MFG. CO., INC.

121 SOUTH COLUMBUS AVENUE • MOUNT VERNON, NEW YORK

65/Circle on Readers' Service Card



Riegel

THE BIAS BUFF

VENTILATED
for use on
Automatic Machines
at Higher Speeds

The fixed, or removable metal center, of Riegel BIAS Buffs has many apertures through which flow fast strong air currents; this air action prevents burning. This special feature makes for longer life — lower costs — more efficiency and unqualified satisfaction to both operator and plant owner.

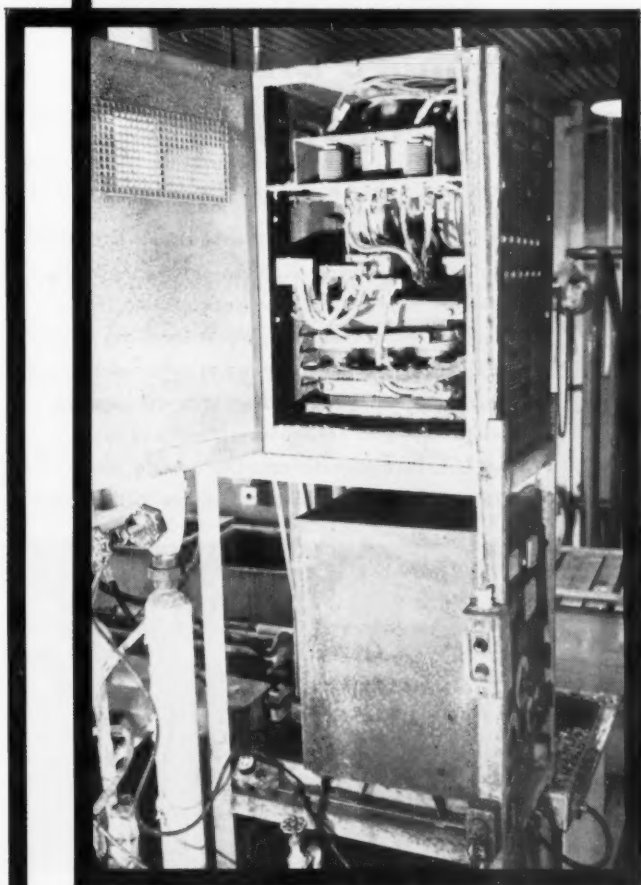
A fair trial of this buff will be proof enough. Send for Prices and Complete Information.

The BIAS Buff Division
RIEDEL TEXTILE CORPORATION
CONOVER, N. C.

Sales Headquarters: 260 Madison Ave.
New York 16, N. Y.

Richardson-Allen plus SILICON makes the difference

Now, check the results of the longest actual field test ever conducted in the electro-plating field...



Picture courtesy of: Semi-conductor Division, Westinghouse Electric Corp., Youngwood, Pa.

Richardson-Allen pioneered in putting SILICON to work in electro deposition rectifiers. Extensive field tests have proved beyond any doubt that Richardson-Allen electro-plating rectifiers with SILICON are first in performance and dependability.

Check the amazing results on this Richardson-Allen installation...

TIME WORKED —

over two years, averaging 16 hours a day, six days a week... and still functioning perfectly with...

NO FAILURES DUE TO CELL —

hermetically-sealed SILICON cells do not age, and never wear out.

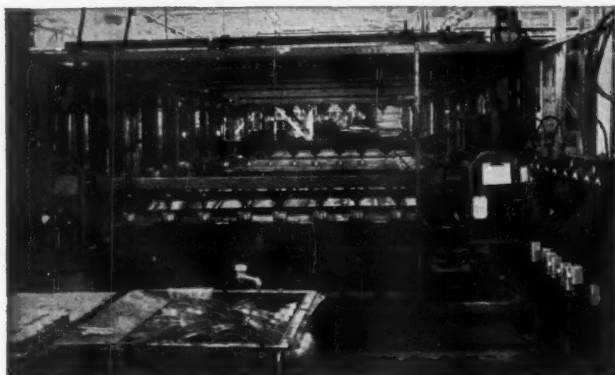
For complete performance dependability, unequalled life and trouble-free hours of constant work, consult Richardson-Allen for SILICON rectifiers specifically designed for electro deposition. Information on selenium and germanium installations also on request.

RICHARDSON-ALLEN Corporation
Dependable Rectifier Specialists

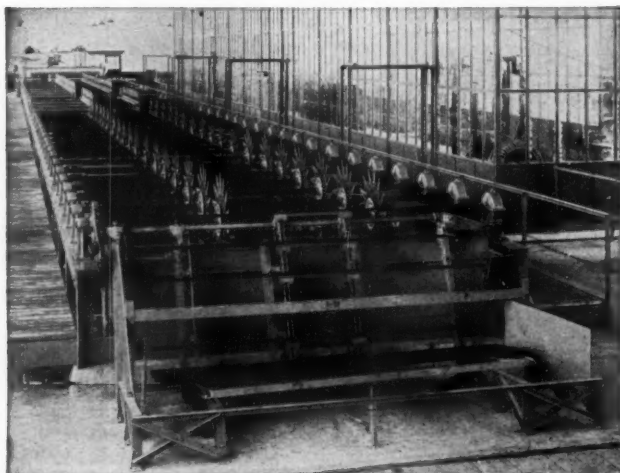
a Manufacturing affiliate of WESLEY BLOCK & CO., INC., 116-15 FIFTEENTH AVE., COLLEGE POINT, L. I., N. Y.
IN CANADA: Richardson-Allen of Canada, Ltd., 1236 Birchmount Rd., Scarborough, Ontario



New High Standards in Plating • Processing • Cleaning



U.S. Fully Automatic Equipment for processing and heavy copper plating the bottoms of popular brand stainless steel cooking utensils. 10 such U.S. installations are in service in 3 plants of this manufacturer.



U.S. Fully Automatic Conduit Pipe Processing Installation. Performs 24 operations in one continuous cycle including cleaning, acid treatment, zinc plating pipe exterior, enamelling and baking interior surface. Capacity—over 60 million feet of pipe per year. Glass enclosure houses U.S. Generator Equipment.

U.S. Automatic Machine for processing tubular steel furniture components. Performs 22 operations automatically including cleaning, copper, nickel and chrome plating and drying in one continuous cycle. Has 5 parallel processing lanes; each can take different kinds of material.



Provides the Right Combination for More Efficient Operation

U.S. Equipment leads where production problems call for ingenious engineering and design for improving quality and lowering costs. Whether your job calls for Electroplating, Electrochemical Treatment, Metal Cleaning, Pickling, Acid Dipping, Drying or other related operations in any required series or combination—intermittent or continuous—it will pay to get U.S. recommendations. Our Service Department is at your disposal, without obligation.

Write for this **FREE Brochure**

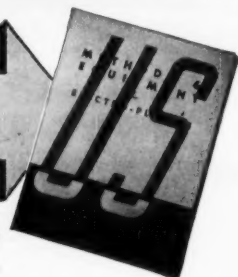
U. S. — A Complete Line of Plating Barrel, Still Tank, Variable Speed, Semi- and Fully Automatic Equipment • Motor Generators & Rectifiers

U. S. GALVANIZING AND PLATING EQUIPMENT CORP.

31 HEYWARD STREET

INCORPORATED 1896

BROOKLYN 11, N.Y., U.S.A.





Metal Finishing

POLISHING AND BUFFING • BARREL FINISHING • CLEANING
PLATING • ANODIZING • RUSTPROOFING • LACQUERING & ENAMELING

MAY, 1958

Volume 56 Number 5

FEATURES

Editorial — Forty-Fifth in Cincinnati	69
A. E. S. 45th Annual Convention	
General Program	70
Technical Program	73
Abstracts of Papers	74
Ladies Program	76
The M.F.S.A. and its Predecessor, the I.F.C.	77
By A. P. Munning	
National Association of Metal Finishers Program	81
Factors Affecting Residual Stress in Electrodeposited Metals	82
By Dr. Joseph B. Kushner	
Use of a Nickel Plating Bath as an Analytical Standard	88
By J. B. Mohler	
Science for the Coatings Technologist — Part IX	89
By E. S. Beck	
Science for Electroplaters — Part XXXVI	93
By L. Serota	
Phosphating Treatments — A Comprehensive Patent Literature Survey	97

DEPARTMENTS

Shop Problems	101	Obituaries	146
Patents	103	News from California	146
Abstracts	110	Associations and Societies	148
Recent Developments	112	New Books	153
Business Items	134	Manufacturers' Literature	161

Published Monthly By
Finishing Publications, Inc.

Established in 1903 as Metal Industry by Palmer H. Langdon 1868-1935.
381 Broadway, Westwood, N. J.
North 4-1530

L. H. Langdon, President-Treasurer; Palmer H. Langdon, Publisher; Thomas A. Trumbour, General Manager; Joan T. Wiarda, Sales Manager; Nathaniel Hall, Technical Editor; Daniel A. Marino, Ass't. Tech. Editor; Fred A. Herr, Pacific Coast Editor; John E. Trumbour, Equipment & News Editor; Inez Oquendo, Assistant Editor; Elizabeth Meyers, Circulation Manager.

BRANCH OFFICES

Los Angeles 14, Calif.
219 West 7th St.
MAdison 6-5421

Chicago 1
35 East Wacker Drive
FIncancial 6-1865

SUBSCRIPTION INFORMATION

United States and Canada \$4.00 per year, other countries \$8.00. Single copies 65c in United States and Canada, other countries 85c. GUIDEBOOK-DIRECTORY 26th edition 1958 current, 680 pages 5 1/4 x 7 1/8, subscriber's edition \$2.00 per copy, deluxe edition \$3.50 per copy. Please remit by check or money order; cash should be registered. Request for change of address should reach us on or before the 15th of the month preceding the issue with which it is to go in effect. In sending us your change of address, please be sure to send your old address as well as the new one. It is difficult and often impossible to supply back numbers. Copyright 1958 by Finishing Publications, Inc. All rights reserved. Contributed articles, letters on pertinent subjects are invited. Their publication, however, does not necessarily imply editorial endorsement. Re-entered as second class matter June 13, 1940 at the post office at New York, N. Y. under the Act of March 3, 1879.



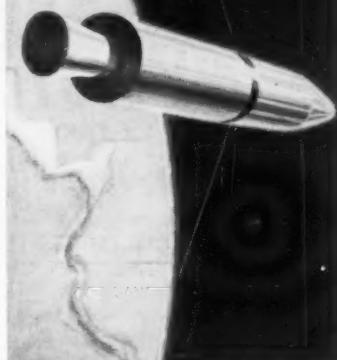
Audit Bureau
of Circulations

Member



Society of Business
Magazine Editors

Technic Gold
is in orbit
with
"Explorer"



Certain component parts of "Explorer", the first American satellite, required gold plating. Logical choice was Technic 24 karat INDUSTRIAL GOLD — the first and purest soluble 24 karat gold in the world. Or out of it!

UNIQUE PROPERTIES SOLVE UNIQUE PROBLEMS

Precious metals are finding extraordinary applications in industry and the laboratory. Electroplating offers an efficient method of exploring and exploiting such characteristics as the unique and diverse properties of gold — not found in combination in any other form.

TECHNIC SERVICE

If you have requirements for electroplated gold, other precious metals, or alloys — consult Technic. We equip you with controlled electroplating apparatus and/or solutions that eliminate variables, assure precise performance reproducible as often as required. Find out how Technic Service assures quality with economy.

Phone, wire, TWX or write . . .

160-8

TECHNIC, INC.

39 Snow Street,
Providence, R. I.
JACKSON 1-4200
Chicago Office—7001
North Clark Street



THE LARGEST ENTERPRISE OF ITS KIND IN THE WORLD

68/Circle on Readers' Service Card

NO HALF-BAKED PROTECTION

with Unichrome Coating 218X

That's one of its advantages...

An exclusive built-in "cure indicator" in Unichrome Coating 218X assures extra service life for your racks. In baking, this vinyl plastisol coating changes color from bright green to olive green. A uniform olive green color shows that 218X is fully cured and ready to deliver all advantages for which it is noted — toughness; outstanding resistance to all plating and cleaning solutions, even vapor degreasing cycles; and the resiliency to bounce back after hard use.

Platers have been saving maintenance money for over 10 years now with Coating 218X... first in the field. They have found that using the best quality at the outset saves most money in the long run.

Are you taking advantage of the coating that stands out on all five major counts? Send for details.

*Are you using the rack coating
that gives you ALL FIVE?*

- * 1. Built-in cure indicator
assures maximum performance
- 2. No contamination of plating baths
- 3. Ability to be rebaked for patching
- 4. Nationwide set-up of expert applicators
- 5. Highly qualified technical service



First name in plastisols for all plating purposes...

METAL & THERMIT CORPORATION

GENERAL OFFICES: RAHWAY, NEW JERSEY

Pittsburgh • Atlanta • Detroit • E. Chicago • Los Angeles

Member, Vinyl Dispersions Division of the SPI

In Canada: Metal & Thermit—United Chromium of Canada, Limited, Rexdale, Ont.



Forty-Fifth in Cincinnati

It's been thirty-six years since Cincinnati last played host to an Annual Convention of the *American Electroplaters' Society* and, for many finishers, this will be their first visit to the *City of Seven Hills*.

As usual, the conventioneer will be offered educational sessions, at which twenty-five or more technical papers are to be presented, parties, outings, a banquet, and the opportunity to visit three plants, including the largest plating installation in the area. He will meet many friends, renew old acquaintances, make new contacts, and bring himself up-to-date on what has developed since the last convention. The various committee chairmen and their aides have labored long and hard to prepare a program which will measure up to the standards set in previous years. Theirs is a thankless task and the credit they receive is well deserved. After experiencing the heat wave in Montreal last June, this editor is especially grateful for the May 18 - 22 date, which should insure more comfortable weather conditions.

Most of the time, when the compliments and expressions of appreciation are being passed around, very little praise has been reserved for a very important group of contributors to the success of these conventions. We refer, of course, to the *Metal Finishing Suppliers' Association*, originally the *International Fellowship Club*, whose members are responsible for a large part of the entertainment, and through whose largess more than one financial catastrophe has been averted. This is the group to thank for shouldering the various expenses which, otherwise, would be reflected in the registration fees. The M.F.S.A. has never sought the limelight. It has been satisfied quietly to cooperate with the A.E.S. to make each convention something to remember with pleasure, and to dig down deep when necessary, beyond the call of duty.

We thought this would be a good time to bring to the attention of our readers the facts about our virile and progressive trade association and prevailed upon one of its prominent members to prepare for publication in this issue of METAL FINISHING the story of the M.F.S.A., its beginnings, its aims and its accomplishments. These are accomplishments for which the organization, justifiably, can take a bow. After reading it, those who are so fortunate as to attend this and subsequent conventions will know who, acting in the background, should be given a full share of the credit for a job really well done.

Nathaniel Hall

A.E.S. TO HOLD 45th ANNUAL CONVENTION



CINCINNATI, MAY 19-22



FOR the second time the *American Electroplaters' Society* has selected Cincinnati for the annual convention. The last national meeting held here was way back in 1922 at the same hotel, now known as the Sheraton-Gibson. No predictions on attendance have been made by co-chairmen *Charles Wise* and *Ezra A. Blount* but, with the attractive program and central location, a large attendance is to be expected. Several other branches of the A.E.S. are cooperating in putting on this convention: *Indianapolis, Columbus, Dayton and Louisville*. Concurrently with the A.E.S., the *National Association of Metal Finishers* will hold its annual meeting. *John Palik, Jr.* of *National Plating Corp.*, *Cleveland*, heads up this group.

There will be no exposition or exhibits this year, and the convention program follows the traditional pattern of Monday through Thursday, with registrations for early arrivals on Sunday, as well as various committee meetings. The principal innovation over other years is the change in date from June to May. In 1959 the A.E.S. convention will be shifted back to June in Detroit, and held with an Industrial Finishing Exposition.

Louis Michelson, manager of *Rocket Engines, Flight Propulsion Laboratory, General Electric Co.*, will give the Keynote Speech. His subject is one of great current interest, "*The Propulsion Requirements for the Vanguard Missile*."

A registration fee of \$20.00 will entitle one to admittance to the technical sessions and social events as shown in the general program which follows:



Francis T. Eddy
Supreme President



Charles Wise
Convention Chairman



Herberth E. Head
1st Vice-Pres.



Ralph Wysong
2nd Vice-Pres.



Dr. W. A. Wesley
3rd Vice-Pres.



Dr. Samuel Heiman
Past President



John P. Nichols
Exec. Sec'y.



Robert D. Miller
Educational Chairman

General Program

All events are scheduled at the *Hotel Sheraton-Gibson* unless otherwise specified. Eastern Daylight Saving Time used throughout program.

Sunday, May 18

9:00 a.m.

PARLOR E

EXECUTIVE BOARD MEETING (All Day)

9:00 a.m. - 9:00 p.m.

BALLROOM LOBBY

NATIONAL ASSOCIATION OF METAL FINISHERS (NAMF) REGISTRATION

9:30 a.m.

PARLORS 7, 8 & 9

ANNUAL MEETING (NAMF)

1:00 - 8:00 p.m.

BALLROOM LOBBY

REGISTRATION

1:30 p.m.

PARLOR I

BOARD OF DIRECTORS (NAMF)

2:00 p.m.

PARLOR G

TRUSTEES' MEETING; METAL FINISHING SUPPLIERS' ASSN. (MFSA)

4:00 p.m.

PARLOR E

CREDENTIALS COMMITTEE

7:00 p.m.

NAMF EXECUTIVE SECRETARY'S SUITE MEETING, Representatives NAMF Locals

9:00 p.m.

ROOF GARDEN

GET-TOGETHER PARTY (Admission by Registration Book Ticket)

Monday, May 19

9:00 a.m.

PARLOR 1

BREAKFAST MEETING, NAMF and MFSA Executive Committees

9:00 a.m. - 5:00 p.m.

BALLROOM LOBBY

REGISTRATION

9:00 a.m. - 5:30 p.m.

BALLROOM LOBBY

REGISTRATION (NAMF)

10:00 a.m.

ROOF GARDEN

OPENING SESSION

11:00 a.m.

SHERATON ROOM

BUSINESS MEETING, SUPREME SOCIETY

11:15 a.m.

FOURTH ST. ENTRANCE

BOARD BUSES FOR LADIES' LUNCHEON

12:00 noon

PARLORS 4 & 5

BRANCH SECRETARIES' LUNCHEON

12:00 noon

BALLROOM

LUNCHEON MEETING (MFSA)

12:15 p.m.

PARLOR 6

SPEAKERS' LUNCHEON

1:00 p.m.

COLONY RESTAURANT (Swifton Village)

LADIES "AUNT ELLA" LUNCHEON, Sponsored by Oakite Products, Inc., David X. Clarin, Host. (Admission by Registration Book Ticket)

1:00 p.m.

FOURTH ST. ENTRANCE

BOARD BUSES FOR INSPECTION TRIP, Cincinnati Milling Machine Co.

2:00 p.m.

ROOF GARDEN

EDUCATIONAL SESSION A (Admission by Badge)

2:00 p.m.

CINCINNATI MILLING MACHINE CO.

INSPECTION TRIP (Buses leave 1:00 p.m.)

2:00 p.m.

SHERATON ROOM

FIRST EDUCATIONAL SESSION (NAMF)

2:30 p.m.

PARLOR 1

EDITORIAL BOARD MEETING



Ezra Blount
Convention Co-Chairman



Hotel Sheraton-Gibson
Headquarters

4:30 p.m.

PARLOR 7

ORDER OF PAST PRESIDENTS, BUSINESS MEETING

6:30 p.m.

PARLOR 6

PAST PRESIDENTS' DINNER

7:00 - 9:00 p.m.

BALLROOM LOBBY

REGISTRATION

9:00 p.m.

ROOF GARDEN

FELLOWSHIP OPEN HOUSE (MFSA) (Admission by Registration Book Ticket)

Tuesday, May 20

8:00 a.m.

PARLOR H

MEMBERSHIP COMMITTEE BREAKFAST

8:00 a.m.

PARLOR 6

SPEAKERS' BREAKFAST

8:30 a.m.

KENWOOD

GOLF TOURNAMENT (MFSA) KENWOOD COUNTRY CLUB

9:00 a.m. - 12:00 noon

BALLROOM LOBBY

REGISTRATION

9:00 a.m.

PARLOR 1

PUBLIC RELATIONS COMMITTEE MEETING

9:00 a.m.

PARLOR 4

MIDWEST REGIONAL COUNCIL MEETING

9:00 a.m.

BALLROOM

EDUCATIONAL SESSION B (Admission by Badge)

9:00 a.m. - 12:00 noon

BALLROOM LOBBY

REGISTRATION (NAMF)

9:30 a.m.

PARLORS 7, 8 & 9

SECOND EDUCATIONAL SESSION (NAMF)



Arthur J. Gerada
Athletic Chairman



Raymond A. Barry
Plant Visitation



Malcolm Fogg
Educational



Stewart Chipman
Entertainment Chairman



A. R. Waters
Banquet Chairman



Robert K. Rarick
Finance Chairman



L. A. Critchfield
Co-Ordination Chairman

W. Wilson Loveless
Hotel Chairman
President



L. J. Howald
Publicity Chairman

Edwin Roof
Registration Chairman



Roger Winterman
Program Chairman

Wm. D. Gordon
Educational



Dr. R. O. McDuffie
Educational



11:30 a.m.

FOURTH ST. ENTRANCE
BOARD BUSES — CONEY ISLAND OUTING

1:00 p.m.

CONEY ISLAND
ANNUAL OUTING, EAST-WEST BALLGAME (Admission by Registration Book Ticket)

6:30 - 8:00 p.m.

ROOF GARDEN MEZZANINE
REGISTRATION (NAMF)

7:00 p.m.

ROOF GARDEN
RECEPTION & COCKTAIL PARTY (NAMF)

8:00 p.m.

ROOF GARDEN
ANNUAL BANQUET (NAMF)

Wednesday, May 21

8:00 a.m.

PARLOR 1
RESEARCH COMMITTEE BREAKFAST

8:00 a.m.

PARLOR 6
SPEAKERS' BREAKFAST

9:00 a.m. - 12:00 noon

BALLROOM LOBBY
REGISTRATION

9:00 a.m.

BALLROOM
EDUCATIONAL SESSION C (Admission by Badge)

9:00 a.m.

SHERATON ROOM
EDUCATIONAL SESSION D (Admission by Badge)

9:00 a.m.

PARLOR 1
RESEARCH COMMITTEE MEETING

9:00 a.m.

PARLOR F
EDUCATIONAL COMMITTEE MEETING

12:00 noon

PARLOR H
BRANCH LIBRARIANS' LUNCHEON

12:00 noon

ROOF GARDEN
LADIES' LUNCHEON, Sponsored by Products Finishing, Mrs. Robert D. Miller and Mrs. Bill Young, Hostesses. (Admission by Registration Book Ticket)

12:00 noon

PARLOR 6
SPEAKERS' LUNCHEON

12:00 noon

PARLOR 4
UNIVERSITY OF CINCINNATI ALUMNI LUNCHEON

2:00 p.m.

PARLOR 1
RESEARCH COMMITTEE MEETING

2:00 p.m.

BALLROOM
EDUCATIONAL SESSION E (Admission by Badge)

2:00 p.m.

SHERATON ROOM
EDUCATIONAL SESSION F (Admission by Badge)

9:30 p.m.

ROOF GARDEN
FLOOR SHOW AND DANCE (Admission by Registration Book Ticket)

Thursday, May 22

8:00 a.m.

PARLOR 6
SPEAKERS' BREAKFAST

8:30 a.m.

FOURTH ST. ENTRANCE
BOARD BUSES FOR INSPECTION TRIP to American Radiator and Standard Sanitary Co.

9:00 a.m. - 12:00 noon

BALLROOM LOBBY
REGISTRATION

9:00 a.m.

SHERATON ROOM
BUSINESS MEETING, SUPREME SOCIETY

9:00 a.m.

BALLROOM
EDUCATIONAL SESSION G (Panel: "Practical Plating Problems")

9:30 a.m.

INSPECTION TRIP to American Radiator and Standard Sanitary Co., Plumbing and Heating Div. (Buses leave at 8:30 a.m.)

12:00 noon

PAVILION CAPRICE, NETHERLAND-HILTON HOTEL

LADIES' LUNCHEON, Sponsored by Udylyte Corp., Dr. R. B. Saltonstall, Host. (Admission by Registration Book Ticket)

12:00 noon

FOURTH ST. ENTRANCE
BOARD BUSES FOR ELECTRIC AUTO-LITE CO., SHARONVILLE DIV.

1:00 p.m.

INSPECTION TRIP. Electric Auto-Lite Co., Sharonville Div. A buffet lunch will be served at the plant, courtesy of the Electric Auto-Lite Co.

2:00 p.m.

SHERATON ROOM
BUSINESS MEETING, SUPREME SOCIETY

2:00 p.m.

PAVILION CAPRICE, NETHERLAND-HILTON HOTEL

LADIES' PLATO PARTY, Joan T. Wiarda, Hostess

7:00 p.m.

NETHERLAND-HILTON HOTEL
ANNUAL BANQUET AND DANCE (Registration Book Ticket Must be Exchanged for Banquet Ticket Prior to Wednesday Noon)

Technical Program

Monday, May 19, 1958

2:00 p.m.

Session A — Surface Preparation

Chairman: John Holland, Arvin Industries
Educational Committee Representatives: Malcolm T. Fogg, Globe Chemical Co.; Elmer W. Rehme, Metal & Thermit Corp. — Indianapolis Branch Assistants.

1. The Role of the Basis Metal in the Production of Stressed Electrodeposits, *Dr. Joseph B. Kushner*, Kushner Electroplating School.
2. Effect of Shot-Peening Prior to Chromium Plating on the Fatigue Strength of High Strength Steel, *Bennie Cohen*, Wright-Patterson Air Force Base.
3. Loose Abrasive Finishing Machines, *Fred T. Hall*, General Motors Corp.
4. AES Project No. 14, The Influence of Physical Metallurgy and Mechanical Processing of the Basis Metal on Electroplating, *Dr. Maurice H. Jones and J. Zajdowski*, Ontario Research Foundation.

Tuesday, May 20, 1958

9:00 a.m.

Session B — Waste Treatment and Disposal

Chairman: William Neill, Columbus Metal Products, Inc.
Educational Committee Representative: Dr. R. O. McDuffie, University of Cincinnati — Columbus Branch Assistant.

1. Metal Wastes — Contribution and Effect — Cincinnati Metropolitan Sewage Disposal Service Area, *Fenton H. Dobb*, City of Cincinnati, Sewage Disposal Section.
2. Ion Exchange and the Pickling of Magnesium Sheet, *Robert E. Anderson*, The Dow Chemical Co.
3. The Use of Bioassays in the Safe Disposal of Electroplating Wastes, *Dr. Charles M. Tarzwell*, Robert A. Taft Sanitary Engineering Center.
4. Industrial Waste Treatment and Water Reclamation — A Case Study, *Wayne L. Gasper*, The Maytag Co.

Wednesday, May 21, 1958

9:00 a.m.

Session C — Symposium on Electroplating Practices

Chairman: Dr. R. O. McDuffie, University of Cincinnati.
Educational Committee Representatives: Ezra A. Blount, Products Finishing; William

D. Gordon, MacDermid, Inc. — Cincinnati Branch Assistants.

1. Principles of Electrochemistry, *Fred G. Brune*, Chrysler Corp.
2. Factors Which Influence the Structure of Electrodeposits, *Dr. A. M. Max*, Radio Corporation of America
3. Cleaning, Pickling and Preparatory Surface Treatment, *William P. Innes*, MacDermid, Inc.
4. Discussion of a Typical Plating Solution — Cyanide Zinc, *Edward F. Foley*, Stratford Chemical Co., Inc.

Session D — Specialized Finishes for Aircraft Components

Chairman: Julius Teres, Wright-Patterson Air Force Base.

Educational Committee Representative: William B. Stephenson, Jr., General Electric Co. — Dayton Branch Assistant

1. Alloy Plating Systems for Aircraft Engines, *Bruce E. Scott*, Curtiss-Wright Corp.
2. Electrodeposited Metallic and Flame Sprayed Ceramic Coatings for Elevated Temperatures, *Dr. Stanley Zirinsky*, General Electric Co., and *Dr. Dodd S. Carr*, Bart Laboratories & Design, Inc.
3. Hard Anodizing of Aircraft Fuel Metering Components, *Dr. Harold J. Wiesner and Henry A. Meers*, Bendix Aviation Corp.
4. Pitting in Thick Chromium Deposits, *Donald R. Millage and Wilbur E. Hague*, The Udylite Corp.

2:00 p.m.

Session E — Symposium on Electroplating Practices

Chairman: Gerald A. Lux, Oakite Products, Inc.

Educational Committee Representatives: Ezra A. Blount, Products Finishing; William D. Gordon, MacDermid, Inc. — Cincinnati Branch Assistants.

1. Instrumentation, *Harold A. Kahler*, General Motors Corp.
2. Design and Engineering Problems in Plating Room Layout and Installation, *Hugh V. McGuire*, McGuire Associates.
3. Plating Rack Design and Insulation, *Frank J. Klein*, Rack Processing Co.

Session F — Developments in Finishes and Controls

Chairman: William H. Safranek, Battelle Memorial Institute.

Educational Committee Representatives: Lester A. Helmich, Bendix Aviation Corp.; Evans Foertmeyer, General Electric Co. — Dayton Branch Assistants.

1. When and How to Select an Organic Coating, *Harris G. Beck*, The Glidden Co.
2. Vinyl Plastisols and Organisols as Product Finishes, *F. L. Scott and W. C. Hosford*, Metal & Thermit Corp.
3. Measurement of Chromium Plate Thickness on Molybdenum Alloy Turbine Buckets by X-Ray Fluorescence, *Dr. William M. Spurgeon and Otis L. Isaacs*, General Electric Co., AGT Div.
4. Pattern Plating with Electrodeposits, *Samuel S. Frey*, Oakite Products, Inc.

E. W. Rehme
Educational



Lester A. Helmich
1st Vice-Pres.



Donald W. Gusse
2nd Vice-Pres.



Gordon T. Speers
Treasurer

David L. Kaplan
Secretary



Wm. B. Stephenson, Jr.
Branch Librarian



William Young
MFSA Representative



Thursday, May 22, 1958
9:00 a.m.

**Session G — Panel Discussion —
Practical Plating Problems**

Chairman: Dr. Abner Brenner, National
Bureau of Standards

Educational Committee Representative:
Robert L. Winston, Electric Auto-Lite Co.
— Louisville Branch Assistant.

Panel Members: Dr. A. Kenneth Graham,
Graham, Savage & Associates, Inc., Prepara-
tion of Base Metal and Decorative Plating;
Dr. Harold J. Read, Pennsylvania
State University, Corrosion; Lloyd O. Gil-
bert, Rock Island Arsenal, Conversion
Coatings and Military Requirements; F.
Keller, Aluminum Company of America,
Anodizing and Plating on Aluminum;
Harold F. Smith, The Smith Electrochemi-
cal Co., Specialty Work, Job Shop Opera-
tion; Fremont L. Scott, Metal & Thermit
Corp., Organic Coating.

Abstracts of Papers

The Role of the Basis Metal in the Production of Stressed Electrodeposits

By Dr. Joseph B. Kushner, *Kushner
Electroplating School*

The role of basis metal surface condition
and cathode deposition film on stresses pro-
duced is discussed. Grain size, deposit thick-
ness, magnitude of stresses developed and

other factors are covered in the light of re-
cent literature and experimentation. A theory
is proposed as an explanation for this be-
havior.

Effect of Shot-Peening Prior to Chromium Plating on the Fatigue Strength of High Strength Steel

By Bennie Cohen, *Wright-Patterson
Air Force Base*

This effect has been studied in an effort to
minimize the drastic drop in fatigue strength,
approximately 50%, which occurs as a result
of chromium plating. Results using various
high strength steels will be compared in-
cluding baked and unbaked conditions.

Loose Abrasive Finishing Machines

By Fred T. Hall, *General Motors Corp.*

Equipment has been developed which em-
ploys dry, moist or wet slurry abrasive me-
dias in a loose or free state. Such equipment
is finding widespread usage for finishing
decorative parts prior to plating and for de-
burring, burnishing, blending, or edge radi-
using machined parts. Different techniques
are used in processing, but normally each in-
volves submerging the parts into bulk abra-
sive mixture. By various arrangements of
moving the article to be finished through the
abrasive or by flowing or scrubbing the abra-
sive over the article, a positive and efficient
means of stock removal is obtained.

AES Project No. 14 — The Influence of Physical Metallurgy and Mechanical Processing of the Basis Metal on Electroplating

By Dr. Maurice H. Jones and J. Zajdowski,
Ontario Research Foundation

A comparison of the influence of the sur-
face condition of an aluminum killed steel,
resulting from various commercial and lab-
oratory polishing techniques, on the durabil-
ity of a Watts nickel deposit. Several types
of mechanical finishing of the basis metal
studied include commercial belt polishing
with alumina abrasives and laboratory pol-
ishing with silicon carbide and diamond
abrasives.

Metal Wastes — Contribution and Effect Cincinnati Metropolitan Sewage Disposal Service Area

By Fenton H. Dobb, *City of Cincinnati
Sewage Disposal Section*

The paper deals with a municipality em-
barking on a sewage disposal program, in-
cluding an ordinance for control of indus-
trial waste, especially metal contaminants.
Factors such as inspection, cooperation, and
acquisition of information and analyses of
industrial wastes from companies in this
service area before and after the ordinance
was enacted into law are discussed.

Ion Exchange and the Pickling of Magnesium Sheet

By Robert E. Anderson,
The Dow Chemical Co.

The role of ion exchange in the metal in-
dustry is discussed including purification of
exhausted or contaminated solutions and re-
covery and concentration of valuable ma-
terials from dilute solutions. An automatic
ion exchange process for acetic acid — ni-
trate pickling of magnesium sheets, show-
ing reduction of costs and labor and im-
provement of quality control is described.

The Use of Bioassays in the Safe Disposal of Electroplating Wastes

By Dr. Charles M. Tarzwell,
Robert A. Taft Sanitary Engineering Center

A method of predicting the influence of
individual components on the toxicity of
complex waste water is described. How bio-
assays can be used to determine what process
contributes most to the toxicity of waste
water, how it varies and the type and extent
of treatment necessary to render it safe for
aquatic life is discussed.

Industrial Waste Treatment and Water Reclamation — A Case Study

By Wayne L. Gasper, *The Maytag Co.*

The planning which went into the building
of a complete waste treatment facility is dis-
cussed, together with the results of three
years experience in industrial waste treat-
ment and the reclamation and reuse of
water after treatment. Costs of waste treat-
ment and some of the methods used to reduce
costs will be described.

Principles of Electrochemistry

By Fred G. Brune, *Chrysler Corp.*

Using Faraday's Laws as the basis for
electroplating, principles of chemistry and
electricity are explained. Ionic action in elec-
troplating solutions is covered to show the
changes which occur where electrical energy
is used to produce a metallic plate. Other
electrochemical properties of electroplating
solutions are discussed.

Factors Which Influence the Structure of Electrodeposits

By Dr. A. M. Max,
Radio Corporation of America

The theory of metallic crystals and the



Crosley Field, Home of Cincinnati Reds

role of imperfections in determining the physical properties of the common metals is surveyed. Factors affecting the character of electrodeposits are discussed including metal ion transition to the crystal lattice of the cathode, co-deposition, crystal formation, and properties of electrolytes.

Cleaning, Pickling and Preparatory Surface Treatment

By William P. Innes, *MacDermid, Inc.*

Modern practices in cleaning, degreasing, pickling, and activation of various metals prior to electroplating are discussed. Chemical and physical aspects of cleaning and degreasing and actions of pickling and activation solutions on metal surfaces are covered. Fundamental principles upon which these preplate treatments are based are covered and modern cycles illustrating these operations are outlined.

Discussion of a Typical Plating Solution Cyanide Zinc

By Edward F. Foley, *Stratford Chemical Co., Inc.*

The cyanide-zinc plating solution is covered thoroughly beginning with a discussion of bath composition (including the various bright plating solutions), purification of the solution prior to use, and operating conditions. Equipment required for zinc plating and engineering considerations connected with this solution are discussed.

Alloy Plating Systems for Aircraft Engines

By Bruce E. Scott, *Curtiss-Wright Corp.*

Performance of electrodeposited lead-in dium, lead-tin, and silver-lead under high stress and cavitation erosion conditions is evaluated. Use of electroless nickel on aluminum and the increased salt spray resistance of cadmium-tin is discussed. High ambient temperature corrosion protection of nickel-cadmium and characteristics of new alloy systems of copper-tin, silver-tin, and tin-copper are explained.

Electrodeposited Metallic and Flame Sprayed Ceramic Coatings for Elevated Temperatures

By Dr. Stanley Zirkinsky, *General Electric Co.* and Dr. Dodd S. Carr, *Bart Laboratories & Design, Inc.*

Application of heavy nickel and chromium (.005 to .040") to nickel and to copper and over plates of rhodium, platinum, and palladium and flame sprayed alumina are discussed. Reactions of various coatings to a 5000° K plasma jet from a water stabilized arc are evaluated.

Hard Anodizing of Aircraft Fuel Metering Components

By Dr. Harold J. Wiesner and Henry A. Meers, *Bendix Aviation Corp.*

The conditions for applying thin or heavy hard coating to various aluminum alloys are given. Methods of controlling thickness on various sections of complicated shapes are discussed. A statistical comparison of various thickness measurement methods is included.



Procter & Gamble Ivorydale Plant

Pitting in Thick Chromium Deposits

By Donald R. Millage and Wilbur E. Hague, *The Udylyte Corp.*

The type of defect that is described as a "catalyst pit" and pitting due to basis metal defects are discussed. Results obtained by drilling a micro-hole in the basis metal and plated with and without a surface-active agent are presented. The effect of surface-active agents upon the porosity of thin plates is included.

Instrumentation

By Harold A. Kahler, *General Motors Corp.*

Control instrumentation, in recent years, has given assistance to the electroplater in meeting the exacting demands of specification deposits and lower operating costs. The application, use, and merits of instrumentation for large and small installations are reviewed. The advantages of some special electrical and solution control devices are discussed in detail.

Design and Engineering Problems in Plating Room Layout and Installation

By Hugh V. McGuire, *McGuire Associates*

Factors involved in planning an electroplating installation are discussed including production rate, type of equipment, type of plating, plating cycles, arrangement of equipment, exhaust systems, location of power units, type of heat or cooling equipment, water pre-treatment and/or disposal. Equipment installation details to eliminate operating and maintenance problems will be suggested.

Plating Rack Design and Insulation

By Frank J. Klein, *Rack Processing Co.*

Various kinds and types of plating racks are discussed including materials used, size, and construction for various types of plating and cycles used. The five principal types of rack coatings used today, methods of application of insulation materials and the relationship between the coating and the type of plating being done is explained.

When and How to Select an Organic Coating

By Harris G. Beck, *The Glidden Co.*

Properties of the various organic finishes and the relation these have to surface pre-treatment are discussed. Application of and curing procedures for organic finishes with their features and economics are presented along with suitable testing procedures to enable the engineer to specify and the customer to obtain the finish desired.

Vinyl Plastisols and Organosols as Product Finishes

By F. L. Scott and W. C. Hosford, *Metal & Thermit Corp.*

Polyvinyl chloride plastisols and organosols are finding greatly expanded use in the functional and decorative fields. Wide ranges in the hardness and smoothness of finish are obtainable. These materials exhibit excellent chemical resistance and electrical insulation properties. Application methods include dipping, roller coating, spraying, and forming by molding.

Measurement of Chromium Plate Thickness on Molybdenum Alloy Turbine Buckets by X-Ray Fluorescence

By Dr. William M. Spurgeon and Ottis L. Isaacs, *General Electric Co., AGT Div.*

Thickness of chromium plate on molybdenum alloy turbine buckets was measured non-destructively at six different locations. The method used was that of absorption by the plate of the characteristic radiation emitted by the molybdenum substrate. The procedure is suitable for quality control of chromium plate thickness on turbine buckets.

Pattern Plating with Electrodeposits

By Samuel S. Frey, *Oakite Products, Inc.*

How definite patterns can be produced upon electrodeposited nickel and thin bright plates deposited over it without loss to the pattern intensity will be shown. The details of time, agitation, temperature, current density and chemical composition of the bath will be discussed. Process details for making these patterns and problems to be solved for commercial applications are covered.

Ladies Program



Addabelle Miller
Chairman, Ladies Committee

Sunday, May 18, 1958

1:00 - 8:00 p.m.

BALLROOM LOBBY

REGISTRATION

9:00 p.m.

A.E.S. GET-TOGETHER PARTY. Music, dancing, refreshments.

Monday, May 19, 1958

1:00 p.m.

AUNT ELLA LUNCHEON, sponsored by Oakite Products, Inc., Colony Restaurant, Swifton Center. Style show at Rollman's following lunch.

9:00 p.m.

M.F.S.A. OPEN HOUSE

Tuesday, May 20, 1958

Morning

LADIES will be welcome at Kenwood Country Club for golf.

Afternoon

OUTING at Coney Island Amusement Park.

Wednesday, May 21, 1958

12:00 Noon

LUNCHEON at the Sheraton-Gibson Roof Garden, sponsored by *Products Finishing* magazine. Audience-participation program.

9:30 p.m.

FLOOR SHOW AND DANCE.

Thursday, May 22, 1958

12:00 Noon

LUNCHEON at the Pavilion Caprice of the Netherland-Hilton, sponsored by The Udy-lite Corporation; followed by annual Plato Party in the afternoon, Joan T. Wiarda, hostess.

7:00 p.m.

ANNUAL BANQUET AND DANCE.

Other things to see and do in Cincinnati . . . Ride to the observation tower of the Carew Tower, in the heart of downtown Cincinnati, where you can see the city and the surrounding hills and across the river into Kentucky . . . take a short ride up to Eden Park, a beautiful wooded area of 185 acres overlooking the Ohio River; while you're in Eden Park you'll want



Bunt Young
Ladies Co-Chairman

to walk through the Irving Krohn Memorial Conservatory, a huge greenhouse where many rare and beautiful plants and flowers are on display; and the Art Museum (rated one of the top ten in the U. S.) is within the park boundaries also . . . take the children to the Cincinnati Zoo, which has recently completed a modernization program. Taft Museum is within walking distance of the convention hotel; it houses an art collection equal to that of many larger museums . . . and if you can get hubby to take an evening on the town, you'll want to have dinner and see the show at Beverly Hills Country Club, one of the nation's largest and most beautiful supper clubs.

Recommended Eating Places in Cincinnati:

Captoni's Restaurant, 610 Main Street. An excellent Italian restaurant where delicious Italian and American foods are served in attractive dining rooms. Fine wines and liquors.

Colony Restaurant, across from headquarters hotel, on Walnut St. Very good food, home-made pastries, several large, beautiful dining rooms, cocktail bar.

Maisonette, 505 Walnut St. A nationally recognized exclusive French restaurant serving very tasty, artfully prepared French cuisine. Cocktail bar.

Mill's Restaurant, 31 E. 4th St. A popular cafeteria that serves good food in pleasant surroundings.

Mecklenburg's Garden, 302 E. University Ave. A fine old German restaurant, established in 1889. Excellent German foods, specializing in sauerbraten and wiener schnitzel. Fine wines and liquors.

Gourmet Restaurant, Terrace-Hilton Hotel, 15 W. 6th St. One of the nation's top restaurants. A very exclusive dining place serving a la carte foods in the modern surroundings of the ultra-modern Terrace-Hilton Hotel. Glass-walled dining room overlooks the city. *Pignall's*, 462 E. 5th St. 1957 Holiday Magazine Award Winner for Distinctive Dining Service. Specializing in French cuisine.

Valerio's Italian Restaurant, 114 E. 6th St. Famous for individually prepared Italian dishes served in an old-world atmosphere.

Wong's, 216 E. 6th St. Excellent Cantonese food.



Joan T. Wiarda
Plato Party Hostess

The M.F.S.A. and its Predecessor, the I.F.C.

By A. P. Munning, Secretary, M.F.S.A.

This article brings the story of the M.F.S.A. right up to date and carries on from the one which was written in 1949 on the 25th anniversary of the group. The latter begins on page 68 of our June 1949 issue. In the current installment, photographs of the past presidents start with the year 1941, except for the founding president.—Ed.

JUST as the National Association of Electroplaters of the United States and Canada which was established in 1909 became the American Electroplaters Society, Inc., in 1913, so also for practical reasons did the International Fellowship Club, through transformation, become the present Metal Finishing Suppliers' Association, Inc.

The few surviving organizers and history inform us that the South Room of the Hotel Pfister in Milwaukee became the cradle of the I.F.C. on Thursday, July 3rd, 1924, when late that afternoon nineteen men actively engaged in selling products to the plating craft sought means to unify the salesmen in the industry for sociability and a chance to talk "shop".

The record states that many of the most prominent men on the continent, engaged in selling, addressed the gathering and there was a beneficial exchange of views which resulted in the appointment of a "Committee of the Whole" to ascertain how best to pursue their mutual interests, but the most important step taken was the designation of June 23th, 1925 for their next meeting, when they dined in the evening at the Mount Royal Hotel in Montreal during the following A.E.S. convention.

It was at this banquet that the I.F.C. was christened and received the name that clung to it through 1951 and for twenty-six years was synonymous with the "Open House Party" which it sponsored, and which was so indispensably a part of every succeeding annual A.E.S. convention.

The charter members of the organization will be recognized by today's older men in the industry as having made many outstanding contributions

to the progress and development of the art and commerce of metal finishing. They were — Charles H. Proctor, Frank J. Clark, R. H. Sliter, N. P. Hunter, C. J. Moyen, Thomas B. Haddow, Harry C. Flanagan, R. J. Hazucha, S. L. Cole, Frank Terrio, Thomas A. Trumbour, G. A. Tanner, W. G. Stoddard, Benjamin Popper, W. M. Schneider, Van Winkle Todd, Wilfred S. McKeon, George E. Lawrence, and John C. Oberender. The last three in order were elected to serve one year as chairman, vice-chairman and secretary, respectively.

In a retrospective appraisal, sight must not be lost of some significant aspects of this club: It had a high determination to succeed, a resolute inclination to advance and elevate the standards in the trade and a strong desire to foster acquaintanceships. Headquarters changed each year from one place to another depending upon the location of the secretary and, in its formative years, the club had no treasurer, collected no dues, and eligibility

OFFICERS AND TRUSTEES 1957-1958



M. M. Beckwith
President



Earl W. Couch
1st Vice-Pres.



Raymond F. Ledford
2nd Vice-Pres.



F. P. Green
3rd Vice-Pres.



Tom Trumbour
Treasurer



A. P. Munning
Secretary



T. R. Gill
Trustee



C. C. Helmle
Trustee



L. J. Minbiole
Trustee



R. M. Norton
Trustee



Wilfred S. McKeon
1925



David X. Clarin
1941



Richard Crane
1942



Charles Schlott
1943



Frederic Gumm
1944-5

for membership was restricted solely to those in the selling profession.

It would pin-point the time of the establishment of this unique organization more specifically if we reminded the reader that it came to life in the year Woodrow Wilson died, or perhaps even more forcibly, if we mentioned that it took form in the year chromium plating was being investigated as having some practical applications.

There were a few other underlying facts which seemed to be persuasive: Even though the A.E.S. held its regular annual convention in Providence, R. I., in 1923, the year preceding the formation of the I.F.C., chroniclers remind us this was also the year of the first Metal Finishers' Exposition and that it was held between April 9th and 14th in Dayton, Ohio. This show was not a project of the A.E.S. Supreme Society. It was the idea and achievement of the Dayton Branch of the A.E.S. and thirty-seven firms displayed their wares, but the majority of them exhibited finished products such as electrical appliances for household and industrial uses and very few manufacturers of electroplating equipment and supplies were represented.

Each day of the exposition had its own designation and feature; there was an Opening Day, an Industrial Day, a Ladies' Day, A School Day and an A. E. S. Day. This innovation was successful and a revelation in both interest and economics, to a degree where it was suggested that it be made an annual affair and to coincide with the annual A.E.S. convention.

There were some other singular aspects of the times which should be remembered: While the membership of the A.E.S. in early days comprised a large segment of supervising platers from captive shops and those who controlled their own jobbing establishments, the preponderant number of registrants at the old conventions were representatives from the supply houses, who were regularly engaged in commer-

cial drumming and, since they were few compared with numbers today and their territories were sizable terrains which they traversed by train, street-car and on foot because the automobile was still a novelty and a luxury, these district representatives could always be found to alter their routine schedules to meet "the boys" when more work-bound and just as enthusiastic platers were debating their ability to be present at a convention.

Then, again, it will be recalled that there was an unusual relationship between the A.E.S. and the I.F.C.: The first president of the A.E.S., *Charles H. Proctor*, was a charter member of the I.F.C. because, between the time he was instrumental in founding the A.E.S. and was its first president and the time the I.F.C. was conceived, destiny altered his outlook from plater to salesman.

A similar situation betook the second president of the A.E.S., *George B. Hogaboom*. At its fourth annual meeting Mr. Hogaboom was elected president of the I.F.C., and there were many other salesmen of this early era who renounced their tanks and solutions to take up their sales kits and price books. Is it any wonder, then, that shortly after an exposition in which the members of the I.F.C. and the concerns by which they were employed were most definitely interested, and at a time when internal changes were perturbing the A.E.S. and thinking was being directed to limiting official positions in the A.E.S. exclusively to master platers, thus relegating representatives of the supply houses to the status of associate memberships, that the men in the selling profession should turn their thoughts to the formation of a league of their own where they might participate with satisfaction and recognition.

There were other disconcerting elements at this period that continued to pervade the atmosphere of the A.E.S., which came into being as an educa-

tional society or, essentially, as a forum to enable the more erudite and aggressive platers through social exchange, to swap formulas, methods of processing, and suggestions regarding ways and means of interpreting and eradicating surprising and unconventional results obtained in their operations.

The Bureau of Standards, due to its new interest in electroplating, which stemmed from its World War I work on lead plating, iron plating, salt-spray testing and the like, was giving stability to the society by way of establishing procedures, specifications, and prototypes for industry as well as the government, so that the supply houses and their bigger customers were constrained to take cognizance of these advances in the field of metal finishing or relinquish their positions in the field.

Science and technology were entering the industry, automation in its early forms was infiltrating the mass production plants, and proprietary cleaning, buffing and plating concoctions were called upon to justify their existences by performance. In short, technicians and engineers were replacing both platers and salesmen in the ranks of the society and their theories and terminology were not very palatable at the outset and beyond the understanding of the old guard. One or the other was destined to remain and take over.

The I. F. C. was also beset with problems. The young A.E.S. was launching its present publication to replace its former *Monthly Bulletin*. It had planned a modern periodical that was expected through the sale of advertising space and the printing of papers delivered at the educational sessions of the society to supplement the revenue derived from membership dues and, in this regard, it did pretty well. However, the conventions which were expensive and speculative, each intended to surpass the previous one in size and excellence, usually incurred deficits with the result that the I.F.C. was regularly called on to make up shortages.

Not until Buffalo in 1951 was this trend reversed. It was then, at the instance of the I.F.C. which advocated that registration fees be raised, that the Convention Committees actually made their total expenses fall within receipts even though the convention was dramatically and suddenly shifted from Los Angeles to Buffalo due to the Korean Episode, and the customary time for preparation was brief.

The I. F. C. over the years was an informal organization rotating around *Tom Trumbour*, the only treasurer it ever had. Each year it elected another president, vice-president and secretary and that action took place during the one and only meeting of each administration, which was held on the first or second day of each annual A.E.S. Convention, after a hearty breakfast and during which it was customary to advise the representatives of the suppliers who were curious and expectant, just what portion of the ultimate convention cost tab they were to be happily assessed. It was the proud duty of each member then to proffer up to the limit he dared stipulate as his contribution to the general fund without first consulting the comptroller of his company's exchequer. Not that the Supreme Society of the A.E.S. did not understand the situation and want to help; they had a set account to advance for this purpose but rarely ever, if we want to be safe, was it large enough to liquidate the obligation. In short, therefore, the I.F.C., like Uncle Sam in reverse, was the silent partner, and there will be many in both organizations today, the A.E.S. and the M.F.S.A., who will raise their brows in astonishment at this disclosure.

The Convention in Boston in 1950, the year before Buffalo, almost wrought mayhem on the goose that laid the proverbial precious metal egg. Boston was originally designated to espouse an exposition-convention. That always portends sizable monetary returns, and its

committee planned along these lines but, when the decision was rescinded after commitments had been made to stage "the best convention yet", it was rather like the fellow who had just settled down in a new home, bought a new car, and then lost his job.

After the initial shock and the mustering of plenty dogged Yankee determination, the show went on as planned and there are none who attended the Boston Convention who will not, in a moment of reminiscence, still sense the delight of the Pops Concert, the Clam Bake, the historical visitations and other opportunities for relaxation from the serious aspects of the sessions. However, like many another experience, the after effects were both sobering and crippling, and again presented a challenge to the I.F.C. to come to the aid of the A.E.S. by importuning its members for additional where-withal over and above the call of duty.

This was the "Silent Service" of the I.F.C. It not only sponsored its own "Open House Party" and Annual Breakfast Meeting at each convention but it assured the success of many of the other activities through its membership's staunch attendance, advertising, displays, individual company entertainments before and after the banquet, at ladies Plato parties, theatre parties, teas, ladies' instruction classes, and in donating many of the much-prized gifts so assiduously sought by the ladies.

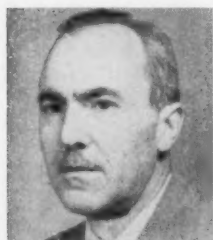
But the Boston Convention did more than that; it caused to bring about a more realistic examination of the possibilities for the future, and it induced the then president of the I.F.C., *George L. Nankervis*, of respected memory, to call a meeting of a select committee of the I.F.C. in the Detroit Athletic Club on December 2nd, 1950 to analyze the responses from its more than a hundred members to a questionnaire fraught with vital queries. In essence, this meeting forecast the demise of the I.F.C. except for its love of fellowship,

and proclaimed it too frail to assume the added burdens to be thrust upon it.

At the first luncheon of the I.F.C. in 1924 there were nineteen men and, at Boston in 1950, there were two hundred and forty-two. The times demanded something more substantial and, at the last I.F.C. meeting in Buffalo, the M.F.S.A. became its robust heir and successor. There the interested fraternity of the metal finishing industry met all afternoon and laid the foundations for a virile and progressive trade association, called it the *Metal Finishing Suppliers' Association*, and approved a resolution to give it corporate status. Representatives of sixty-seven firms attended this first meeting. They deliberated on an agenda prepared well in advance and, with an unusual desire to cooperate in the common interest, they produced a set of regulations and a policy which have never required modification. Membership was reserved to firms rather than to individuals and each member became entitled to one vote on all issues, irrespective of its size, territorial coverage, or volume of business.

The new organization was not without problems. Scarcely had the plans for its formation firmed before it was requested to assume the financial support of the A.E.S. Public Relations Committee, was prevailed upon to establish permanent exhibits of model plating equipment on a small scale in industrial museums in the principal cities, or to accept other financial assignments.

The former I.F.C. and the present M.F.S.A. have always had a close relationship with the A.E.S. and its objectives. It can be said with almost complete accuracy that every member of the M.F.S.A. has at least one and sometimes several dozen people in its employ who are members of the A.E.S. The members of the M.F.S.A. contract for most of the space in the official A.E.S. publication. They are the large proportion of the subscribers to the Re-



W. D. MacDermid
1946



R. W. Renton
1947



Louis M. Hague
1948



Rudolph Hazucha
1949



George L. Nankervis
1950



August P. Munning
1951-2



Albert N. Braun
1953



Manson Glover
1954



Herman J. Struckhoff
1955



Joseph J. Duffy, Jr.
1956

search Projects. They are, by far, the major exhibitors at the Convention-Expositions, they furnish the greater part of the entertainment at the annual conventions, and they supply the preponderance of the speakers at the Branch and National Educational Sessions, as well as to have high representation on the A.E.S. operating committees. How natural is it, therefore, that they should exchange liaison representatives within their official families to

be kept mutually informed with respect to each others problems and objectives. This the M.F.S.A. also does with the *National Association of Metal Finishers* and with other cooperative organizations.

The growth of the *Metal Finishing Suppliers' Association, Inc.*, has been most inspiring. Its 176 members comprise the outstanding and most widely recognized names in the fields they serve. By their support and continued

interest they seek to make valuable contributions in various projected courses of action to their industry and the public interest and eventually to be numbered among those trade associations whose influence for good can be said to be indispensable.

M.F.S.A. Activities at the Cincinnati A.E.S. Convention

Unless otherwise stated, all events will take place at the Sheraton Gibson Hotel.

Sunday, May 18

2:00 P.M.

TRUSTEES MEETING, PARLOR G

Monday, May 19

12:00 Noon

LUNCHEON AND ANNUAL MEETING, BALLROOM

9:00 P.M.-1:00 A.M.

OPEN HOUSE for all registrants at the Convention — Roof Garden. Barney Rapp's Band, Buffet and light drinks served.

Tuesday, May 20

8:30 A.M.

GOLF TOURNAMENT—KENWOOD COUNTRY CLUB. The A.E.S. Convention Committee has agreed to allow any golfer who registered to turn in his outing ticket from the registration book in exchange for a \$1.50 lunch at the Kenwood Country Club. Green fee is \$5.00.

Roger E. Winterman has been designated "Sponsoring Host" for the golf tournament.

Kenwood has two eighteen-hole courses, and has been the host for many major golf tournaments. Most recent of these was the Western Open in 1955.

For further information on the program, write A. P. Munning, Munning & Munning, Inc., 202 Emmett Street, Newark 5, N. J.

Past Presidents	Year	Place of Annual Meeting
*Wilfred S. McKeon	1925	Montreal, Canada
George Lawrence	1926	Newark, N. J.
*Ernest Lamoreaux	1927	Toledo, Ohio
*George M. Hogaboom	1928	Toronto, Canada
*Frank J. Clark	1929	Detroit, Mich.
*Benjamin Popper	1930	Washington, D. C.
*John A. McCabe	1931	Rochester, N. Y.
*Robert Leather	1932	Philadelphia, Pa.
*N. P. Hunter	1933	Chicago, Ill.
Wesley L. Cassell	1934	Detroit, Mich.
Thomas B. Haddow	1935	Bridgeport, Conn.
H. M. Cherry	1936	Cleveland, Ohio
*John Oberender	1937	New York City, N. Y.
Paul Savage	1938	Milwaukee, Wis.
*Oliver Sizelove	1939	Asbury Park, N. J.
*Jack Geissman	1940	Dayton, Ohio
David X. Clarin	1941	Boston, Mass.
Richard Crane	1942	Grand Rapids, Mich.
Charles Schlott	1943	Buffalo, N. Y.
*Frederick Gumm	1944	Cleveland, Ohio
*Frederick Gumm	1945	Pittsburgh, Pa.
W. D. MacDermid	1946	Pittsburgh, Pa.
R. W. Renton	1947	Detroit, Mich.
Louis M. Hague	1948	Atlantic City, N. J.
Rudolph Hazucha	1949	Milwaukee, Wis.
*George L. Nankervis	1950	Boston, Mass.
August P. Munning	1951	Buffalo, N. Y.
August P. Munning	1952	Chicago, Ill.
Albert N. Braun	1953	Philadelphia, Pa.
Manson Glover	1954	New York City, N. Y.
Herman J. Struckhoff	1955	Cleveland, Ohio
Joseph J. Duffy, Jr.	1956	Washington, D. C.

* Deceased.

National Association of Metal Finishers

A two-day educational session and management seminar, instead of the usual one, highlights this year's convention of the *National Association of Metal Finishers*. The additional day brings the total of convention days to three — May 18, 19, and 20.

As has been the custom, the NAMF conclave is being held concurrent with that of the A.E.S., with headquarters and activities at the Sheraton-Gibson Hotel, Cincinnati, Ohio.

An annual meeting of members on Sunday will open the three-day convention. President *John Palik, Jr.* of National Plating Corp., Cleveland, Ohio, is slated to rap his gavel at 9:30 a.m. The board of directors will convene at 1:30 p.m. the same day, and will elect their officers for the year 1958-1959. Monday should find shop owners and operators "talking shop" as the first day's educational program gets under way with *A. T. Leonard*,

president of Superior Plating, Inc., Minneapolis, Minn., serving as moderator. The two-day session includes: Monday—Rust Proofing, Barrel: *Bruce Roberts*, Siegel-Roberts Plating Co., St. Louis, Mo.; *Glenn H. Friedt, Jr.*, United Platers, Inc., Detroit, Mich.; Rust Proofing, Rack: *John Lietz*, B. Mercil & Sons Plating Co. and *Lawrence J. Hay*, Plating Service Co., both of Chicago, Ill.; Tuesday—Decorative Plating: *Mariano Ranno*, Imperial Plating Co., Brooklyn, N. Y.; *Lewis T. Briggs, Jr.*, Erie Plating Co., Erie, Pa.; Hard Chrome Plating; *Duke L. Saas*, Atlas Hard Chrome Service, and *John Hyde*, Durable Plating Co., both of Cleveland, Ohio.

The traditional cocktail party and banquet will be held Tuesday evening. General Chairman *W. Wilson Loveless*, vice president of Varland Metal Service, Inc., Cincinnati, Ohio, announces that *Fay Le Meadows* will speak on, "A Plater's Life Can be Fun."

Program

Sunday, May 18

9:00 a.m. - 9:00 p.m.

REGISTRATION — BALLROOM LOBBY.

9:30 a.m.

ANNUAL MEETING OF MEMBERS — Parlors 7, 8 & 9

1:30 p.m.

BOARD OF DIRECTORS MEETING — Parlor 1.

7:00 p.m.

MEETING, Representatives of NAMF Locals — Executive Secretary's Suite.

Monday, May 19

9:00 a.m. - 5:30 p.m.

REGISTRATION — BALLROOM LOBBY.

9:00 a.m.

BREAKFAST MEETING, MFSA and NAMF Executive Committee.

2:00 p.m.

1ST EDUCATIONAL SESSION & MANAGEMENT SEMINAR — Sheraton Room.

Tuesday, May 20

9:00 a.m. - 12 noon

REGISTRATION — BALLROOM LOBBY.

9:30 a.m.

2ND EDUCATIONAL SESSION & MANAGEMENT SEMINAR — Parlors 7, 8 & 9.

6:30 p.m. - 8:00 p.m.

REGISTRATION — Roof Garden Mezzanine.

7:00 p.m.

COCKTAIL PARTY & RECEPTION — Roof Garden.

8:00 p.m.

ANNUAL BANQUET — Roof Garden.



Officers of the NAMF, from left to right: *Sal Novelli*, Asst. Secy.-Treas.; *Frank Kaiser*, Secy.-Treas.; *Webster B. Knight*, 2nd Vice-President; *Harold W. Baker*, 1st Vice-President; and *John Palik, Jr.*, President.

Factors Affecting Residual Stress in Electrodeposited Metals*

A Critical Evaluation

By Joseph B. Kushner, Ph.D., Director, Electroplating School, Stroudsburg, Pa.

This is the second part of Dr. Kushner's article. The first part appeared in the April issue.—Ed.

Effect of the Cathode Film

At the cathode, once deposition begins, a film forms which will vary in thickness, depending on conditions of temperature, current density, etc., from 10^{-2} to 10^{-5} cm. This is known as the diffusion layer because ions that reach its outer boundary by convection and electrolytic migration can only pass through it by diffusion.

Recent work by O'Brien and Axon⁴³ using a clever interferometric method has shown that this film starts to form in five seconds after the current is turned on and grows to full thickness in about 55 seconds. Their work seems to indicate that it consists of three separate layers or regions of varying composition, about which little is known. For our analysis we need not consider this aspect and can assume it to be a single layer. We have then, this diffusion film and, at the interface, a second layer, the so-called electric double layer, which is roughly of molecular dimensions, about 10^{-8} cm. thick. It is, in effect, the equivalent of a condenser with parallel plates and a very thin gap, in which resides a powerful electric field⁴⁴ (about 10^8 v/cm.).

The electric double layer is not a barren region. It may contain any and all of the following:

1. *Dipoles*. These may adsorb on the metal surface through electrostatic, covalent, or Van der

Waals forces or combinations of these. The water molecules themselves are a good example.

2. *Foreign cations*. Electrostatic or covalent forces may cause these to be bound to the metal surface, in effect mechanically blocking off these areas.

3. *Anions*. It has been demonstrated by Thieson⁴⁵ that it is possible for anions to be adsorbed on a negatively charged surface (!), preferentially at active regions such as edges, angles, and lattice imperfections.

4. *Uncharged particles*. These may be bound to active regions of the surface by specific adsorption mechanisms.

A solvated or complex ion, carrying the metal to be deposited, diffuses through the diffusion layer and reaches the electric double layer where the intense electric field causes the dipolar water molecules in the solvated ion to line up with their axes parallel to the field (there is a similar effect if the complex ions include negative radicals) and, in this way, the process of tearing loose the metal ion from its ionic combination, begins.

The cathode surface is not uniform. At certain active spots it will be much easier to deposit the metal than in other areas. Thus, deposition will be naturally limited to these areas. However, the metal ion may not be discharged exactly over one of these active spots. This means it will have to move a little in the double layer, parallel to the cathode surface until it reaches a good spot to deposit. This being so,

TABLE 3
Residual Stress In Nickel Deposited From Various Solutions

Temperature, 25°C. Current Density 30 amp./sq. ft. All solutions
1M in nickel, 0.5M in boric acid, pH 4. Copper discs used.

Solution Used	Residual Stress At Varying Thickness, psi					Limiting Value*
	0.0001"	0.0002"	0.0003"	0.0005"	0.001"	
Sulfamate	16,000	12,000	10,600	9,600	8,600	8,500
Fluoborate	26,000	20,500	18,600	17,800	17,200	17,000
Bromide	20,400	17,500	15,700	13,400	11,300	11,000
Sulfate	28,000	27,200	25,000	24,000	23,100	22,800
Chloride	37,000	33,200	33,100	33,000	33,000	33,000
Iodide	No deposit. Dark film formed, iodine liberated; slight rise in Stresometer reading indicated considerable tensile stress in film.					
Nitrate	No deposit. Dark film on cathode, probably initial nickel deposit. Polarized. Current drops off to zero after a few moments of operation. Slight rise in Stresometer reading indicated considerable tensile stress in film.					

*Extrapolated and calculated values using method of previous section.

the movement must be made against frictional resistance due to the electrical forces acting and the mechanical obstacles described in the preceding paragraphs.

In order for this to be accomplished, activation energy is required. If the activation energy is sufficient for the purpose, the metal ion, accompanied by its tenaciously clinging sheath of water molecules, will finally break through at an active area and will be discharged by an electron arriving from the generator.

The metal atom just formed is not necessarily in its final position in the lattice. Because of the activation energy it possesses it has considerable mobility as yet and expends this excess energy in searching out a spot in the lattice where it can be most readily attached (where there will be a free energy minimum), such as at the edge or corner of a crystal plane. On bonding there, the balance of the activation energy will be given up.

If the current (source of the activation energy) is large enough, the electrodeposition will take place rapidly, and the metal atoms containing their excess energy will be plated out near to each other. It will then be possible for these active atoms to join together to form a new crystal nucleus which can be the starting point for new crystal planes. As in ordinary crystallization, the criterion for whether or not this happens will be the difference involved between the surface energy and the volume energy.

With this brief picture of the deposition process in mind we can consider the effect of anions in the double layer.

FIGURE 8

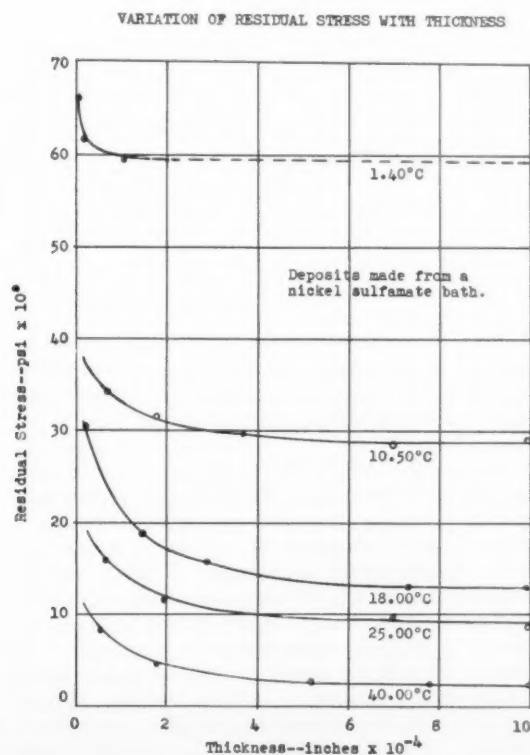
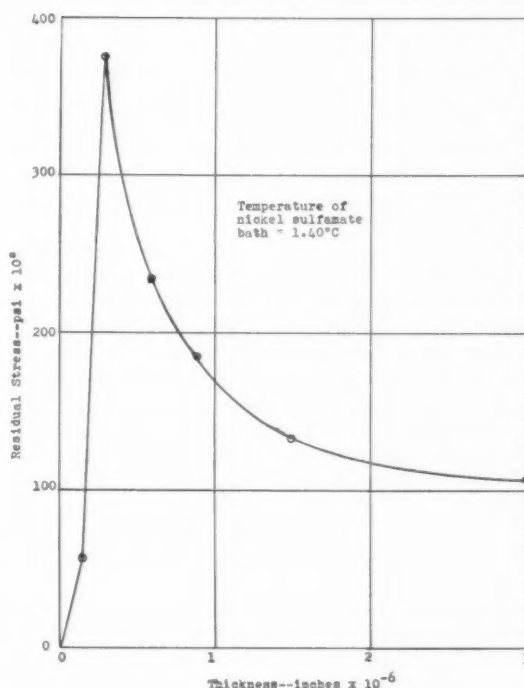
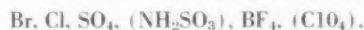


FIGURE 9
Variation of Residual Stress with Thickness



Anions, because they may cause mechanical and electrical hindrance to the discharge of metal ions, should have a fairly strong effect on the activation overpotential (metal overvoltage as distinguished from hydrogen overvoltage). Piontelli⁴⁶ has shown that activation overvoltages for a given metal ion should increase in the following anion sequence:



If Wilman's high temperature theory regarding the cause of residual stress in the deposit is correct, then, in a nickel bath for example, the use of fluoroborate ions should give rise to a higher stress in the deposit than if chloride ions are used, since the activation overpotential will be greater with the fluoroborate ions and there will be this much more excess energy available to expand the lattice.

To test this hypothesis, a series of pure nickel plating baths were made up, 1M in nickel ions, 0.5M in boric acid. Deposits were made and stress values determined. Typical results are given in Table 3.

As can be seen from the table, the results do not indicate that the residual stress rises with a rising overpotential so, unless other evidence can be brought forward, it seems apparent that Wilman's theory is not valid.

An interesting result of this investigation is the fact that the bromide bath which was prepared by reacting barium bromide with nickel sulfate, gave a surprisingly low residual stress, in view of the fact that the chloride bath gave the highest residual stress. It is a known fact that some chloride, or rather chlorine, can be found in nickel deposited from chloride baths,³⁷ and Mathers⁴⁷ has shown that

bromine can be found in copper deposits made from bromide solution. He found that much more bromine is occluded than is chlorine and, in one series of tests with copper deposited from a cupric chloride bath and copper deposited from a cupric bromide bath, found 3.7% chlorine in the deposits from the first bath and 10.7% bromine in deposits from the latter bath. It is probably fortuitous but the ratio of stress in the bromide nickel bath deposit to that in the chloride bath deposit is in the inverse ratio to these two percentages!

Despite the fact that the nickel bromide deposit may contain more occluded material, it appears that this bath may have some commercial possibilities inasmuch as the deposits were silvery white and smooth and fine grained and appeared to remain remarkably free of pitting, the perennial nuisance of the nickel plater. It is believed that the bromide ion may have a mild oxidizing action in destroying small quantities of organic matter (the usual cause of pits). In view of the fact that the tensile stress is low in the deposits, it should be of interest to electroformers.

Effect of Temperature

It is a well known fact that increasing temperature decreases stress. However, to the author's knowledge, no work has been done in the low temperature range. Several experiments were performed using a purified sulfamate bath (1M nickel sulfamate, 0.5M boric acid), at the following temperatures: 1.40°C., 10.5°C., 18.0°C., 25.0°C. and 40.0°C.

Because it is known that the cathode efficiency of

FIGURE 10

Variation of Residual Stress with Temperature
(Semi-log plot)

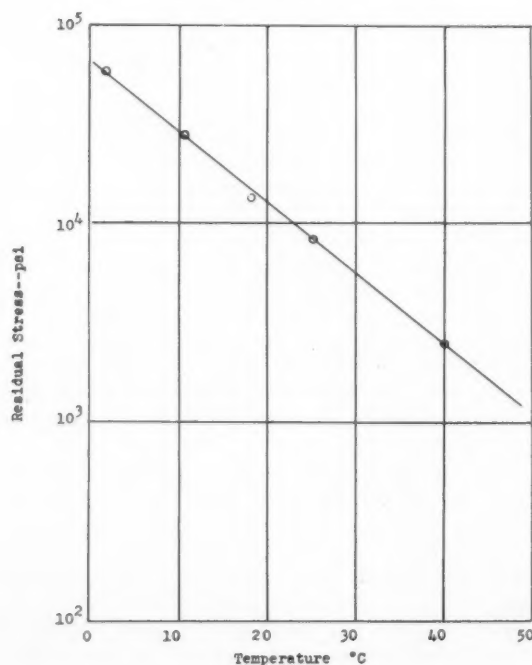
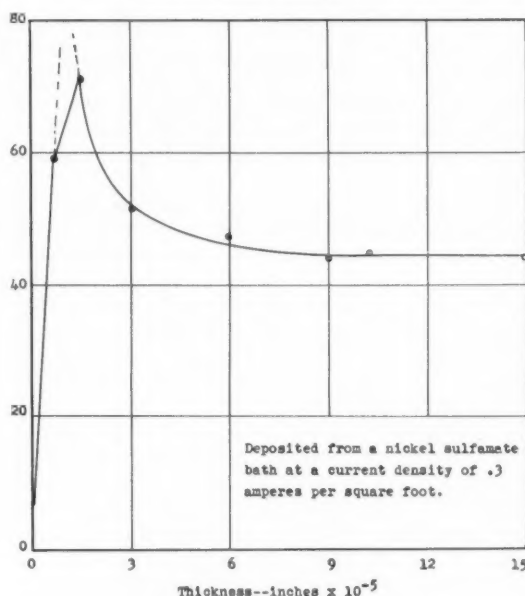


FIGURE 11

VARIATION OF RESIDUAL STRESS WITH THICKNESS
(At low current density)



Deposited from a nickel sulfamate bath at a current density of .3 amperes per square foot.

a Watts bath drops off drastically below 10°C., careful checks were made of cathode efficiency on all the low temperature runs. By weighing the clean discs before and after plating at a known fixed current density of 30 amp./sq. ft., with an analytical balance, the following efficiencies were found as given in Table 4.

TABLE 4

Cathode Efficiency of Nickel Sulfamate Bath

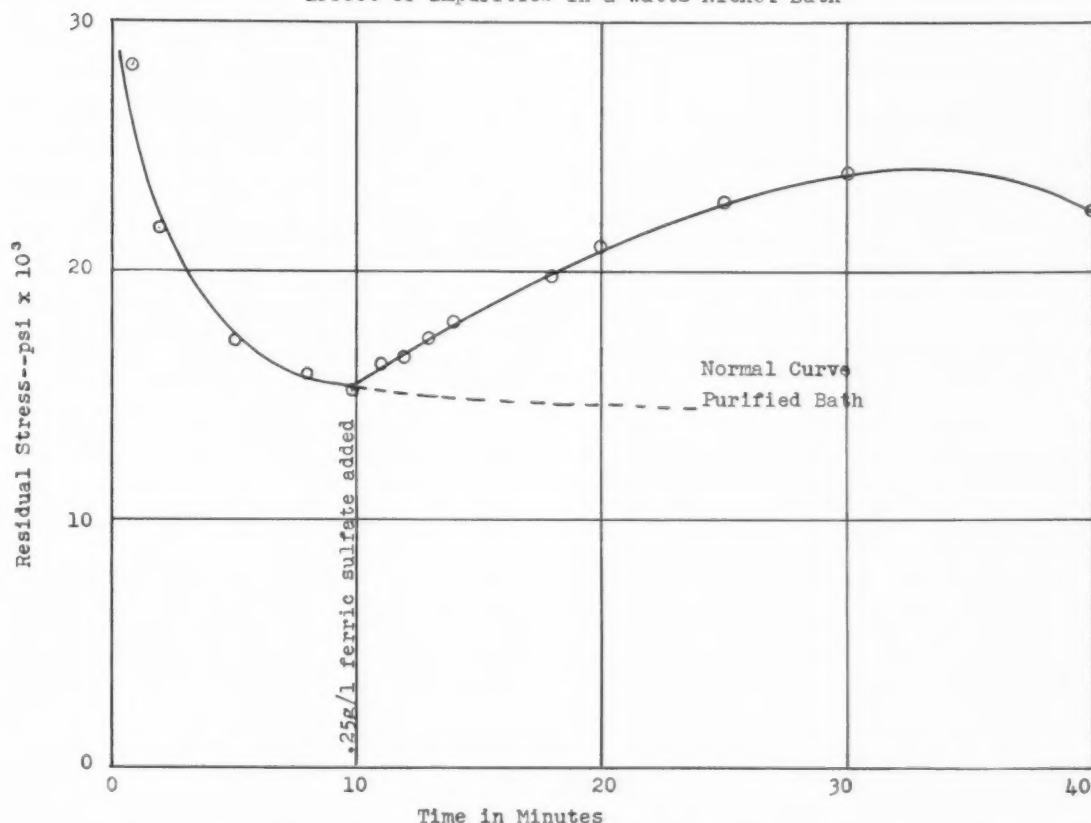
Temp. °C.	Cathode Efficiency %
1.40°	1.14%
10.50°	70.50%
18.00°	93.50%
25.00°	98.00%
40.00°	99.00%
Estimated error in measurement is 2%.	

Based on these efficiencies, the results of the temperature runs in terms of residual stress are plotted in Fig. 8. As can be seen at once, the residual stress does definitely increase as the temperature is reduced.

Most noteworthy is the upper curve ending in a dashed line. The early part of this curve has been placed on a magnified scale and is shown in Fig. 9.

Since each minute of plating at 30 amp./sq. ft. puts on 0.0000263" of thickness at 100% cathode efficiency, at 1.14% efficiency, each minute puts on 3×10^{-7} inches. Since 1 micron is roughly equivalent to 0.00004", each minute of plating puts on about 0.0075 microns or about 75Å of metal. According to the results obtained, therefore, it appears that, in the first 150 Å of deposit, an enormous stress is developed, close to 400,000 psi. The estimated error

FIGURE 12
Effect of Impurities in a Watts Nickel Bath



in the reading in the very early part of the experiment due to the fact that the capillary scale could not be read closer than 0.01" with the magnifying glass used, could possibly reduce the peak value by 50,000 psi to 350,000 psi.

It has been pointed out by several investigators that high stress values such as these may be meaningless, as the yield strength of the basis metal is exceeded. Nevertheless, even though there may be some plastic flow and the laws of elasticity no longer apply, the stress values are probably in error by not more than 20% or so.

It may also be argued that the force should be enough to rupture the thin nickel film, as its tensile strength is greatly exceeded. Again, it may be said that this is not necessarily so inasmuch as it has been shown³⁷ that the tensile strength of very thin electrodeposited nickel films may be very high, much higher than the normal 60-80,000 psi. Brenner made no measurements on films thinner than 0.0005" or so but at 0.0005" the tensile strength was almost 130,000 psi and the curve was still going up sharply in that region. It must also be remembered that very thin films such as this, because they do not have many dislocations, probably possess much greater strength than thick ones. Also interstitial hydrogen, if present, gives added strength. However, such a large force can and does explain why electroplated metals often show cold working effects and textures related to cold working.

The deposit was dark, typical of low efficiency plating baths. In fact, it was rather similar in appearance to deposits sometimes obtained when an excess of hydrogen peroxide has been added to a nickel bath which, likewise, produces a drastic reduction in cathode efficiency, and very high stress.

The curve was followed to a thickness of .0001" only as it would have taken too much time to follow it out to 0.001". The dashed line therefore is an extrapolated line.

Fig. 10 is a semi-log plot of the limiting stress values versus the temperature of the plating bath. As can be seen, all the points with the exception of that at 18° lie on a straight line. The difference, however, is well within the overall estimated accuracy of the measurements. Table 5 gives the values on which the curve was plotted.

TABLE 5
Variation of Residual Stress with Temperature
Nickel Sulfamate Bath. Current Density
30 amp./sq. ft.

Bath Temperature °C.	Limiting Stress psi
1.40	59,500
10.50	27,000
18.00	13,200
25.00	8,500
40.00	2,500

It is known that in the case of a Watts bath there is a stress minimum at 55°C. No conflict is seen with these results, however, inasmuch as the Watts bath has two active anions present and no experiments were performed above 40°C.

Effect of Current Density

It is known that residual stress increases fairly gradually with increasing current density in the normal operating ranges used. It has been stated, however, that it increases very markedly at very low current densities. It was decided, therefore, to investigate a very low current density to see if this were true.

The current density used for the experiment was 0.30 amp./sq. ft. A preliminary test with the set up, using the low range of the precision ammeter, 0-0.10 amperes, indicated it would be difficult to maintain the current selected continuously, with the circuit as it was. The problem was solved, however, by inserting a series loading resistance in the D.C. line which permitted a wider range of control with the variac and enabled the current to be maintained at the value selected with a variation of less than 5%. Because it was suspected that the cathode efficiency would be low, a check sample was run for a cathode efficiency test at this current density. The current efficiency was found to be 57.5%. The deposit was like-

wise dark as is usually the case with low efficiency nickel deposits.

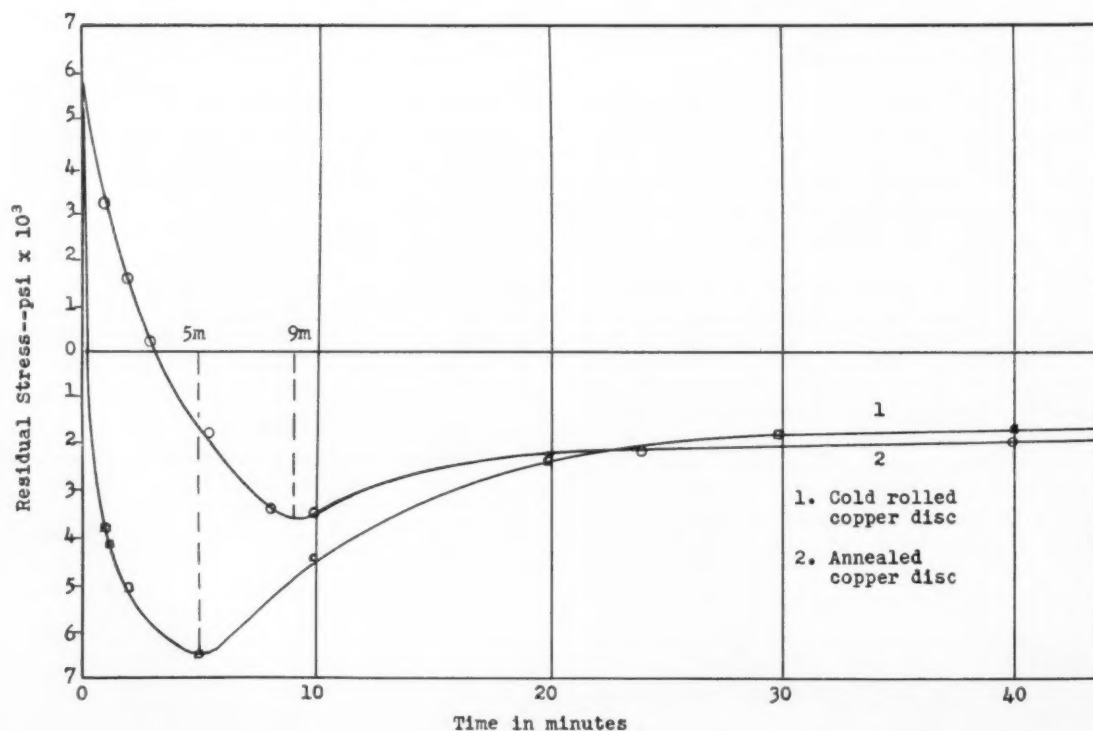
The results of the experiment at a low current density are plotted in Fig. 11. It will be noted that the shape of the curve is about the same as that for the low temperature bath which had the very low efficiency. This apparently indicates that there is some relationship between the efficiency of the bath and the amount of stress developed, everything else being equal. This does not mean, however, that the low efficiency of the bath is the cause of the high stress, but it may mean that whatever is causing the efficiency to be low is likewise causing the stress.

It has been definitely shown that, as the current density is lowered, the oxygen and hydrogen content of nickel deposits increases very markedly. Results obtained in Brenner's investigations also showed that the oxygen and hydrogen content increased as the temperature went down, but the low temperature range was not investigated.

Effect of Contaminants and Addition Agents

Matter in the form of impurities and addition agents may have a pronounced effect on residual stress. Such¹⁸ has pointed out that, in the practical operation of a nickel bath, the presence of unknown contaminants may cause erratic stress results long

FIGURE 13
Effect of Stress Reducing Additive to Nickel Fluoroborate Bath



before their presence becomes known in the worsened properties of the plate.

A simple test of a typical contaminant, iron, was made in the following way: 1 gram of ferric sulfate was dissolved in a small quantity of water and a regular test run was made on a purified Watts solution. After ten minutes of operation at 30 amp./sq. ft. the small quantity of ferric sulfate was added at once and readings were taken on the Stresometer every minute thereafter.

Fig. 12 gives a plot of the results, stress being plotted against time in minutes. As can be seen, within one minute the stress has risen from the normal 16,000 psi for this thickness to 17,700 psi and continues to increase to what appears to be a maximum of 24,000 psi and then starts decreasing. The experiment was not continued beyond the 40 minute time.

Since the concentration of ferric sulfate in the bath amounted to approximately 0.25 grams per liter, only a 0.025% solution, the curve shows how remarkably sensitive the residual stress is to impurities. It also shows how easy it is to obtain erroneous results unless the plating bath has been sufficiently purified and contamination is guarded against.

It is a known fact that certain organic compounds such as saccharine, benzene disulfonic acid, etc., act to reduce stress in nickel deposits and make them compressive. This was verified inadvertently during the course of this research.

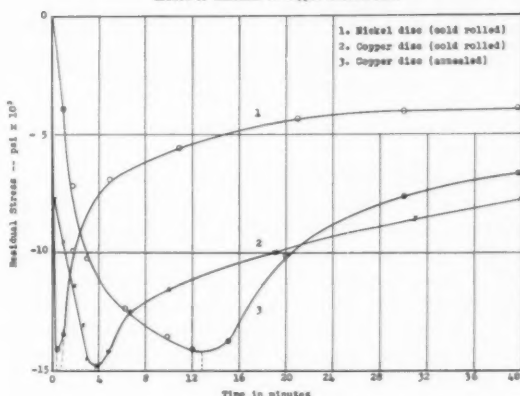
A shipment of ostensibly purified nickelous fluoroborate was received by the writer from a supply house as a donation to the work of this dissertation. Inasmuch as it was shipped as purified, ready for plating, the concentrated solution was diluted and made up to plating strength, 1M, the boric acid and pH were adjusted and the solution was tested at once. The results are shown in Fig. 13.

It was realized immediately that some stress reducing agent was in the bath judging from the curve and the appearance of the deposit, which had the glittery, flaky look typical of an overdose of this type of addition. A second run verified the first result and now a third disc, which had been annealed at bright red heat (approximately 1400°F.) for an hour, was also run, with the result shown.

In view of the results a call was put in to the supplier who traced the shipment. It was discovered that a laboratory assistant had, in error, filled up the shipment bottle, not from a carboy of purified solution, but from a carboy that had been returned by a commercial user, still filled with solution that had been used for experimental purposes. While it could not be verified, it was believed the solution contained saccharine. The contaminated solution was put through the purification procedures described under Experimental Techniques, given a double peroxide treatment and extra long dummaging and, finally, was cleaned up so that it gave normal results.

The results of Fig. 13 are of great interest for several reasons. First, there is the metallurgical aspect which will be discussed in some detail in the following section and second there is the electrochemical aspect which will be covered here.

FIGURE 14
Effect of Thiourea on Copper Sulfate Bath



From the electrochemical standpoint, the interesting thing is this. It will be noted that, in the very early period of deposition, the deposits show the normal tensile stress. This appears to indicate that, in the beginning of the process, the concentration of saccharine (or whatever the agent was) in the double layer is insufficient to interfere with the crystallization process. However, in a few moments there is active interference. This would indicate that the saccharine increased in concentration at the interface not through convection but, more likely, through electrical migration, as part of a complex cation. Mathers (prev. cit.) in a paper that that been too long neglected, gives more than 100 references dealing with this subject, proving that such complex cations can and do exist. While the adsorption process can and does account for a great deal of the observed phenomena, the only logical way in which small quantities of contaminants or addition agents can have such potent effects is because they are brought up to the cathode diffusion film and concentrated there through electrical migration.

A similar type of result for a deposit from a copper sulfate bath to which 1 gram per liter of thiourea has been added is shown in Fig. 14, except that it will be noted that there is no tensile stress in the beginning. This, apparently, is due to the fact that copper is being plated on copper so that there is no lattice mismatch with attendant strains at the start though, as before, grain size exerts a powerful effect. The effect of grain size will be taken up in the next section, which deals with the role of the basis metal. While not shown on the diagram, the stress in the deposit on the annealed copper disc and the cold rolled copper disc approaches the same limiting value, about -4000 psi, as does the stress in the deposit on the nickel disc.

The compressive stress is undoubtedly related to structure. Thiourea is soluble in acid copper but ammonium thiocyanate, its structural isomer, is not. Ammonium thiocyanate, however, will dissolve in alkaline copper cyanide baths and its addition to such baths reduces the normal tensile stresses in deposits from these baths to compressive stresses.

(To be continued)

FINISHING POINTERS

USE OF A NICKEL PLATING BATH AS AN ANALYTICAL STANDARD

By J. B. Mohler

SIMPLICITY, speed and accuracy are the requirements for routine methods of plating bath control. Volumetric methods satisfy the requirements, but some care must be taken to maintain accuracy. Fortunately, the accuracy required is relatively low compared to analyses for other purposes, such as analyses of chemical compounds or alloys. Therefore, one may take a few liberties with methods applied to plating baths. Consider a Watts type nickel bath with a nickel sulfate concentration of 32 oz./gal. An error of 1 oz./gal. would not be serious. This is an error of 3%, a relatively large error for general analytical work. An error of this magnitude is acceptable for plating control but it can be exceeded easily if volumetric solutions are not standardized originally and as they are used. Also many practical analytical methods are only practical because full advantage has been taken of allowable errors. Thus, practical plating methods are not always the same as general accurate volumetric procedures.

Nickel baths do not have to be controlled closely in terms of precise analytical control, but they do have to be controlled within reasonably close limits in terms of plating bath control. The quality of a nickel deposit will change markedly if the bath composition is changed appreciably. The characteristics of the bath also are sensitive to deviations of chemical concentrations. Good control is necessary to maintain both the bath efficiency and the quality of the deposit.

Many tests are required for complete control of a complex nickel bath such as many of the bright plating baths. These include plating tests and analytical tests. Plating tests are essential to control addition agents, to detect the need for filtration and to observe the effects of impurities. Analytical methods provide the means to maintain the concentrations of the major chemicals and to detect specific impurities, such as iron. We may divide the complete control scheme into methods for primary control and methods for secondary control. Routine primary control depends, for the most part, on analyses for nickel, chloride, and boric acid. Some baths can be maintained for long periods by means of regular analyses of these three necessary ingredients. Typical, practical, reliable methods are given in the METAL FINISHING GUIDEBOOK.

Nickel is determined in an ammoniacal solution by titration with sodium cyanide containing dissolved silver and using potassium iodide as an indicator. Chloride is determined by titration with silver nitrate using sodium chromate as an indicator. Boric acid is determined in a glycerine solution by titration with sodium hydroxide using bromocresol purple as an indicator.

The above methods have been used successfully for many years. However, the solution should be standardized occasionally if good control is desired. Experience has shown that a nickel bath of known com-

position provides a convenient standard for all three of the solutions. This might be called a technical standard. Nevertheless, it is quite common in analytical work to include the same major salts during standardization that will be present during an analysis. This general principal is known to apply to the above analyses.

Standard Nickel Solution

The best standard is a nickel bath of essentially the same composition as the bath that is being controlled. A bath that has been carefully analyzed can be used as a standard. A reference solution may be submitted to a laboratory for standardization. It will be well to advise the laboratory that the bath is to be used as a standard. Also, standard baths may be purchased. On the other hand, reliable standards can be prepared by weighing out quantities of the required chemicals, dissolving and making up to a known volume. Analytical grade chemicals are recommended. If the reference nickel bath is not analyzed, then good quality chemicals should be used. It should be realized that some liberties are being taken in this technical procedure and caution must be exercised.

A Watts type bath is made up with nickel sulfate, nickel chloride and boric acid. Dissolve these salts in about 80% of the final volume of distilled water. Adjust the pH to the operating range for the bath (by the addition of sulfuric acid or nickel carbonate). Filter, if the solution is cloudy, and dilute to the final volume with distilled water. The nickel is added as two salts so calculate the total nickel as oz./gal. metallic nickel. Make up the analytical solutions and titrate the standard solution exactly as for the procedures of analyses. Then: concentration divided by titration equals factor.

A technical standard of this type has been used as a basis for control of a nickel bath over a long period of time. The standard is stable and has the unique advantage of serving as a triple standard for three analyses. It is helpful to use a standard of this type to decide on a proper endpoint where there may be some doubt. During the boric acid titration the color changes from dark green to purple, and a decision must be made as to the point at which the titration is complete. The use of a standard with exactly the same color change is the best means to select the endpoint color. An over-titration or an under-titration is not serious when the standard and the sample are both titrated to the same color.

The above procedures have been applied to the methods cited. However, the use of the triple standard is not restricted to these particular methods. A technical reference solution of this type is useful not only as a standard but also as a means to test and demonstrate analytical methods. It is well to consider advantages that induce investigators to continually seek better analytical methods, such as, recent work to analyze nickel baths for boric acid¹ and nickel.²

References

1. M. R. Verma and K. C. Agrawal, "Estimation of Boric Acid in the Presence of Nickel and Ammonium Salts," *Metal Finishing*, **54**, 64 (May 1956).
2. Frank Brako, "Analysis of Nickel in Plating Baths," *Metal Finishing*, **54**, 61 (Sept. 1956).

Science for the Coatings Technologist

Part IX. Metallic Pigments

By E. S. Beck

This installment concludes Part IX of the series by Mr. Beck. The first half of this installment appeared in the April issue.—Ed.

Package Properties

ALUMINUM shows satisfactory package properties when present in small quantities, as in metalics and hammers. Even if small amounts of water are present, there is generally no problem with stability. It must be recognized, however, that aluminum is reactive. Formulations containing aluminum are not as stable as ordinary coatings. Quantities of metalics and hammers should be held down to a few weeks' or months' requirements. Six months should be taken as the outside limit for the stability of these products.

Where the aluminum is present in larger amounts, as in leafing aluminum paints, the stability can be surprisingly good, running to many years, in fact. This is if water is absent, and if the vehicle is very unreactive, and low in acid value. We can assume that the two latter requirements have been met in the formulation of the coating, or it would not be very good in other respects. If water is present in any significant amount, as might be the case from condensation in a varnish tank or the like, a reaction can take place with the aluminum on storage to produce a pressure in the container or even blow out the top.

One might think, from this, that aluminum could never be used in latex paints or other water-based coatings. Yet by adding a relatively small amount of diammonium hydrogen phosphate to the water during the manufacture of the paint, ready-mixed aluminum coatings can be made. These appear to be stable, and suffer from no loss of leafing for a period of a few months, at any rate. The phosphate evidently acts as an inhibitor of the reaction between the aluminum and the water.

Reflectance

The subject of the reflectance qualities of aluminum has been the cause of some little confusion. Aluminum paint has been used for years as a coating for oil storage tanks (to reflect the sun's rays); as a paint for bridges (to increase night-time visibility); as a coating for factory ceilings (to increase lightness of work-areas); etc. It is apparent to the eye that typical films of aluminum coatings are very brilliant and reflective. Yet these same films, if measured on a Hunter Reflectometer, will show reflectances in the neighborhood of 20

to 40. White enamels under the same conditions will show a reflectance in the 80's (if untinted).

This problem is a little easier to state than it is to clarify. To begin with, aluminum coatings do have good reflectivity. In fact, except for white, nothing is better. This despite the low Hunter reflectance values. The reasons for this lie in the definitions of reflectance which are built into the instruments available for the measurement of reflectance. The Huntermeter measures reflectance of a gloss beam at 45 degrees and a diffuse reflectance beam at 0 degrees (or perpendicular to the surface being measured).

Other instruments, designed to measure total reflectance, give a somewhat different story. On the Taylor-Baumgartner reflectometer, aluminum coatings show a total reflectivity of 60 to 70 per cent; while whites run in the range of 75 to 85. Thus, while aluminum is good, white is better. For many applications, where reflectance is the principal consideration, such as ceilings, light reflectors, and the like, white will win out. For outdoor structures where reflectance is important, such as storage tanks for gasoline, white is better. But the superior durability of aluminum is also a factor to be considered.

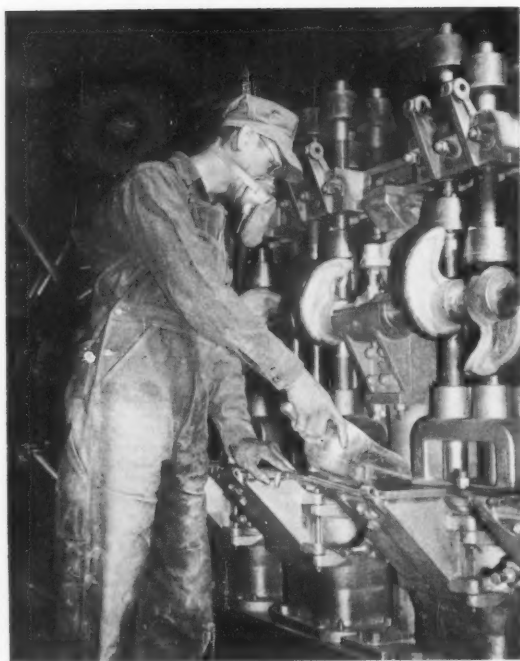
Some tank farm operators have adopted what seems to be an excellent compromise. This is to paint the tops of the tanks in white and the sides in aluminum. The superior reflectance of the white is available where it can do the most good; while the bulk of the tank is coated with the extremely durable aluminum coating.

New Products

It is hardly appropriate to speak of something which has been on the market for ten years as a new product. Yet, in comparison to the much greater age of the more standard products, those now to be considered may be termed new. More to the point, these grades of aluminum are still new to many users and deserve some special mention.

The materials in question are the so-called chrome-type aluminums. They are used principally in the paste form. The aluminum has been so treated that the leafing takes place in a more orderly manner than with the other types of aluminum pigments. The flakes actually lie more in a single plane forming a smoother surface. This results in a higher gloss and specular reflectivity.

The smoothness of surface and high gloss, coupled with the normal brilliance of leafing aluminum, results in a finish which is extremely brilliant and metallic in appearance. The manufacturers claim that the finish



(Courtesy Reynolds Metals Co.)

Fig. 3. Dry Stamping Equipment (Fine Stamps)

The original method of manufacture of aluminum flake was by a stamping or hammering process. It is largely superseded now by the wet milling method. The process is noisy, dusty, dangerous, but very interesting. The metal is first stamped into fairly coarse, relatively large pieces. These are then fed into the stampers which accommodate them, and are hammered until exceedingly thin and fine.

produced rivals chromium plate in appearance. When applied in the best leafing vehicles, and in a proper manner, the surface obtained does markedly resemble a plated metal.

The pastes are offered at a higher solids than most other aluminum pastes. This fact, plus the greater efficiency of the materials, allows a lower quantity paste to be used than is customary with the ordinary pastes. As little as one pound to the gallon will give excellent results. These materials also give a somewhat lower viscosity.

Another new material is the blended paste consisting of leafing aluminum intimately mixed with strontium chromate. The idea of this is to combine the powerful rust-inhibiting properties of the strontium chromate with the protective qualities of the aluminum. In this way, unparalleled protective properties are obtained, according to the claims of the manufacturer. The composite paste has not been available long enough for dependable durability data to have been accumulated. The idea is excellent, however, and is undoubtedly of practical value.

Some newer grades of aluminum pigment intended for use in metallics are of sufficient novelty to warrant a short discussion. In metallic coatings, metal flake of carefully controlled particle size is quite desirable. Large flakes often tend to promote seeding. Extremely fine flakes contribute a graying or muddying action. Pastes are available which are free of both oversize flakes and extremely fine or colloidal particles for use in metallics.

Lining Pigments

We have proceeded to the end of the subject without using the words "lining pigments." As this unusual term is frequently applied to aluminum flakes, a brief mention of its significance might be of value. Very fine aluminum flakes have been called lining grades for many years. Extra fine lining grade pigments are even finer or smaller in particle size. In general, pigments of such fineness that 99% will pass through a 325 mesh screen are in the standard lining and extra fine lining pigment category.

There is some sacrifice in durability in the use of lining grade pigments, as against the coarser types (we are speaking of outdoor exposure); so these pigments are not often used for architectural paints. They are very suitable for metallics and printing inks, and it is here that they find their principal use.

Bronze Flakes

The term "bronze" was once applied both to aluminum and to true bronze flakes. They were distinguished by calling one *aluminum bronze* and the other *gold bronze*. The term is confusing, and its use in this way is diminishing. The expression still is with us in the term *bronzing liquid*, which is used to describe any vehicle intended for use with a leafing flake pigment, aluminum or true bronze.

We will reserve the term bronze for pigments of the copper-bronze series. This series varies in composition from pure copper to zinc-copper blends (some running as high as 30 or 40 per cent zinc). In general, the colors run from the red of pure copper to increasing greenness as the zinc content is increased.

The method of preparing bronze flakes is similar to that used for aluminum flakes. Bronze flakes are not offered in paste form, but only as dry powders. They are prepared in both leafing and non-leafing types, as with aluminum flake. Bronze flakes are available in a variety of particle sizes, but the range is somewhat more narrow than is the case with aluminum pigments, both on the lower and the upper end of the scale.

Because of the greater specific gravity of bronze in comparison with aluminum, the covering power per pound is only around one-quarter that of aluminum. Hence, for equivalent performance, three or four times as much bronze must be used in a paint as aluminum.

The same requirements for leafing vehicles apply to bronzes as to aluminums. However, bronzes are more critical in certain respects. The formulator must be very careful in the choice of vehicles for ready-mixed bronze paints. If any significant acidity is present, there is danger of gelling, or greening in color, or both. Vehicles with reactive tendencies must be avoided, or gelation will occur.

The greening occurs to some degree with almost every paint liquid, except the most inert. In many cases it can be controlled with proprietary stabilizers, or with such materials as citric acid. The vehicle will frequently develop a slight green color with no noticeable effect on the dried film. A greater degree of reaction produces more visible effects, and must be avoided.

Bronzes are very durable, in the sense of providing protection. They show a strong tendency to tarnish, however. This weakness is least evident in nitrocellulose lacquers; although here too it is a problem. With practically all other vehicles, tarnishing is a serious problem. The only satisfactory way to overcome this tendency is by the use of a clear finishing coat to protect the bronze from the atmosphere.

Bronze flake is used, either leafing or non-leafing, chiefly for its mass-tone color in imitation of gold. Metallics based on bronze flake are theoretically possible; in fact are occasionally used. But the lack of stability, low covering power, and tarnishing tendency of bronzes make them rather undesirable for this type of application.

Bronzes do not bake very well. A temperature range of 250 to 300 degrees F is usually given as the upper limit at which this material can be baked. Even at these temperatures, however, there is a definite loss of gold appearance. For this reason, most baking golds are formulated with aluminum flake and transparent pigments to give the desired gold color. Surprisingly good colors can be obtained in this way. The excellent stability and baking properties of the aluminum make dependable baking gold colors possible. They are not suitable for outdoor exposure (in general) but are very good for indoor applications.

It remains only to add that despite all their drawbacks of cost, instability and the like, bronze flake pigments continue to be in substantial use by the paint and ink industry. The reason, of course, lies in the beautiful, brilliant effects which they can produce.

Copper Pigment

By rights, this pigment should be considered as one of the bronze flakes just discussed. However, pure copper has another application which does not apply to any of the bronzes. That is its use as an antifouling agent in marine paints. Copper is one of the metals which is useful in killing or controlling many of the lower forms of life. In the elemental form as well as in the oxide form, it is valuable for keeping barnacles off the bottom of ships. Or more accurately, to reduce the rate of their attachment.

As the oleate and especially as the quinolate, copper is a very useful mildewcide. Were it not for the objectionable green color, this mildewcide would be used much more widely in paints. Copper naphthenate is a familiar ingredient in wood preservatives and treatments for canvas.

Fig. 4. Photomicrograph of fine aluminum flake. This powder is photographed under a magnification of 450 diameters. It is a leafing grade, and it shows a range of individual particles sizes.

Copper for ship-bottom paints is generally in the flake form. It is sometimes used as the sole antifouling agent. Frequently it is optionally replaceable with copper oxide (as in one of the standard Navy paints). Occasionally other toxic agents, such as arsenic compounds, are used with the copper. The formulations are designed to disintegrate at a steady, slow rate, thereby releasing the antifouling agent in sufficient amounts to discourage barnacle attachment. This use for copper pigment probably derives from the old practice of sheathing the hulls of ships with sheet copper, since it was observed that barnacles were very reluctant to attach to copper.

Zinc Dust

This is the last of the subdivided metals which is of any real importance in the paint industry. It is not offered in the flake form, but only as a powder. The material is not used for decorative purposes, as the appearance of zinc dust in a coating is very dull, gray and unattractive.

Zinc dust, however, is a useful pigment because of its anticorrosive properties. The value of a coating of zinc over iron in the form of galvanizing has been known for a long time. Zinc is quite electropositive compared to iron, so the former provides cathodic protection. This means that under test conditions (and most usage conditions) the zinc will protect the adjacent iron until the last small quantity of the zinc is itself oxidized or eroded away, even though bare iron is exposed at the same time.

This property of zinc is not so easy to transfer to a paint coating, however. This is because the zinc in the protective coating is not in good electrical contact with the iron base metals and with all the other zinc particles in the paint film. As a result, the first coatings made from zinc dust were less than spectacular. Gradually, as experience was gained, it was learned just where the value of such coatings lay.

Zinc dust coatings, at least in the conventional types



(Courtesy Reynolds Metals Co.)

now under consideration, are best used as primers. The most widely-used form is as a zinc dust-zinc oxide primer. Great quantities of zinc dust are used, often eight pounds or even more to the gallon. This type of coating, in an oil, alkyd or varnish vehicle, does not have extremely good outdoor durability in a single coat. But it serves as an excellent primer for other materials.

The anticorrosive properties are not as good as those of chromates and red lead however, and it is rarely used where these pigments can be employed. There are certain applications where non-toxicity is of the utmost importance, and it is in these applications that zinc dust-zinc oxide primers are used. An example is the coating of underground water pipe against corrosion.

In addition to its mild anti-corrosive properties, this type of primer has one outstanding value. It adheres well to zinc and galvanized surfaces. This type of base is often difficult to coat permanently with ordinary paints. Everyone has seen how paints crack off galvanized signs. This difficulty can be avoided by priming the galvanized surface first with a zinc dust-zinc oxide primer.

Another type of zinc dust primer has recently been getting some attention. This is the so-called zinc-rich primer. The philosophy of this formulation is the return to cathodic protection. If the zinc content (all metal: no zinc oxide is used in this type of material) were increased to an absolute maximum, perhaps some, at least, of the benefits of galvanizing could be obtained. The zinc-rich compositions generally run over 90 per cent zinc; and some run as high as 96 per cent. Just enough binder is used to make the zinc dust particles stick together. No true paint film properties are obtained at all. The films are permeable (at least when fresh) and show little flexibility.

They are rough and flat in appearance. But they do show corrosion resistance (over iron or steel) of a very high order. Apparently by overloading the film with zinc metal, the necessary electrical contact with the basis metal and with the other zinc particles is obtained.

These coatings dry very rapidly, and may be recoated within a few minutes. Salt-spray and humidity tests with properly formulated topcoats show extremely long breakdown times.

It is very questionable, however, that the protective qualities of zinc-rich coatings approach those of galvanizing. These coatings are best used as primers, al-

though a heavy coat frequently shows surprisingly good performance by itself. These coatings are very expensive (because of the high metal content) and are not easy to apply, especially where a smooth appearance is wanted. Nonetheless, their virtues are quite marked, and their use is steadily expanding.

Zinc dust is extremely reactive, and the vehicle in which it is used must be carefully selected. The presence of even small amounts of water is dangerous, containers having been known to explode from the reaction between zinc dust and water. Hydrogen gas is produced, and the resulting pressure built up in the package will bulge the ends and ultimately burst the package if it is not vented.

As long as these factors are borne in mind by the formulator, and properly allowed for in the manufacture of the coating, perfectly safe and usable coatings are obtained. It is a good idea, however, for the user to stock only a minimum of the material, and to inspect his containers at intervals for bulging or other signs of pressure. If these are found, it is only necessary to vent the package in some way. In most cases the usability of the product is not affected in any way; as the amount of zinc consumed in the reaction is quite small, despite the large volume of gas production.

Other Metals

The use of all other subdivided metals in coatings is minor. Lead has been proposed as an anti-corrosive pigment. Gold leaf, in flake form, makes beautiful coatings but, at \$560 a pound, this pigment is seldom used. Stainless steel is used, very infrequently, where metallic appearance is desired in an anti-corrosive composition. Aluminum and zinc are both readily attacked by acids and alkalis, hence unfit for exposure to corrosive atmospheres of this nature. Stainless steel does very well. The price is extremely high, however, and the usage correspondingly limited.

Flaked silver is offered for conductive coatings and conductive surfaces. Since silver is extremely conductive, it is used on such things as highest-quality printed circuits. Its price precludes more extensive usage. Nickel is available both in flake and powder; in fact it can even be obtained as a paste flake. It is offered for alkali-resistance, for anti-fouling, and for corrosion-resistance.

Many other subdivided metals are available for uses other than coatings. Nonetheless, it is fascinating to speculate on the possibilities of such materials as antimony, bismuth, cadmium and manganese in coatings.

Science for Electroplaters

36. Organic Chemistry

By L. Serota

Introduction

FEW branches of chemistry have contributed as much to developments in the plating industry as the division classified as organic chemistry. Advancements in virtually every phase of plating may be attributed to the ever expanding use of organic compounds. Organic compounds, used as degreasing agents, wetting agents, and chelating agents, have been instrumental in attaining improved methods in metal surface preparation; organic compounds as inhibitors have aided pickling operations appreciably; addition agents and brighteners (organic compounds) included in plating solution formulations have improved, materially, the plated surface; and organic compounds as ion exchangers are now used extensively in recovery cycles.

From the engineering standpoint impressive strides have been achieved by the use of synthetic resins and plastics for corrosion prevention in ventilation or exhaust ducts. Additional application includes use for rack coatings, strippable stop-off coatings, tanks and tank linings, pipe and pipe fittings, barrel equipment, anode bags and diaphragms.

The seemingly perplexing terms associated with organic compounds, and the confusion resulting from efforts to differentiate between the various types, may be considerably overcome by a study of the basic principles relating to this branch of chemistry. A better understanding and appreciation of the extensive literature pertaining to organic compounds in the plating industry may thus be gained.

Historical

Organic chemistry relates to the chemistry of organic compounds. The term was used to designate chemical compounds that were associated with or produced in living plant or animal organisms. It was believed that a "vital" or "life force" was necessary

for the formulation of such substance. Laboratory preparation of organic compounds, therefore, was considered impossible. Substances or compounds occurring in minerals were classified as "inorganic" compounds. Hence, the distinction between compounds of animal and vegetable origin, which were known as organic, and the mineral substances which were considered inorganic.

This view was dispelled in 1828 when the laboratory (artificial or synthetic) preparation of urea, $\text{CO}(\text{NH}_2)_2$, a product resulting from the decomposition of proteins in the body, was achieved by Wohler, by heating a mixture of ammonium sulfate and potassium cyanate. Urea, when reacted with formaldehyde, will produce a thermosetting resin, a product which L. F. Scott notes, is used in metal finishing for decorative and protective finishes. L. Packman refers to the use of urea as one of the recommended addition agents for obtaining a smoother finer grain deposit in acid copper plating baths.

The term organic chemistry applies now to the chemistry of carbon compounds. The distinction, however, is not too sharply drawn, since such carbon compounds as carbon dioxide; carbon disulfide, a brightener for silver cyanide baths; hydrogen cyanide, and sodium carbonate, or those carbon compounds with a mineral origin are generally classified as inorganic compounds. Differences in properties, however, between organic and inorganic compounds are generally pronounced. For example: organic compounds are usually soluble in such solvents as carbon tetrachloride, chloroform, alcohol, and ether, whereas inorganic compounds are but slightly soluble or more often insoluble in such solvents; many inorganic compounds are soluble in water, but organic compounds are slightly soluble or not at all; organic reactions are usually slow (non-ionic),

whereas inorganic are generally rapid (ionic); organic compounds are frequently characterized by a striking color, whereas this property is not so common for inorganic compounds; carbon-atoms in organic compounds possess the property of combining or joining together to give a chain-like structure, whereas atoms of an element in inorganic compounds do not show this characteristic.

Hydrocarbons

The simplest organic compounds, composed of carbon and hydrogen, a group consisting of a large number of compounds, are called hydrocarbons. The simplest of these compounds, the gas methane, CH_4 , is a member of a class of hydrocarbons belonging to the paraffin (from Latin, *parum affinis*, little affinity) series, a group characterized by chemical inertness and non-reactivity. They are not affected by most acids, such as nitric, sulfuric, and hydrochloric; alkalies, such as sodium hydroxide; or oxidizing agents, such as chromic acid; and they are little changed by the action of metals or reducing agents. Nitration of paraffins, when in the vapor phase, will yield nitroparaffins. The lighter weight members of the series, like methane, or gasoline, burn readily in excess oxygen or air, producing carbon dioxide and water; but, the higher members, such as paraffin, do not burn completely, yielding instead a good deal of free carbon and water. Chlorine will react with hydrocarbons under varied conditions, giving substitution products. Bromine will react less readily, and iodine not at all.

The source of the hydrocarbons of the paraffin series is petroleum or crude mineral oil. Separation of the different compounds in petroleum is attained by fractional distillation, a method based upon differences in boiling points of the compounds comprising this mixture. The first fraction in this distillation process, containing the light oils which distill over up to a temperature of 200°F ., consists of petroleum-ether and gasoline or benzine; the second fraction, the illuminating oils, (distillation range 200° to 275°F .) includes kerosene; and, a third fraction (above 275°F .) will contain spindle, machine, and cylinder oils. Additional products obtained by this process are petroleum jelly and paraffin wax. The tar residues remaining in the still are used for asphaltic coverings and roofing. Further separa-

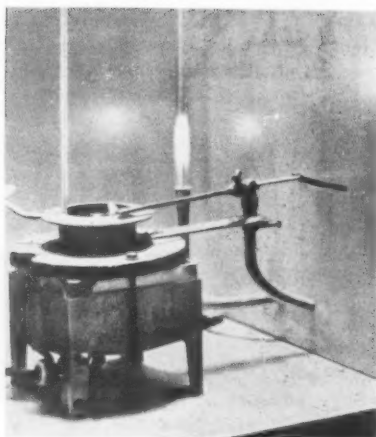


Fig. 158.

tions of the three fractions into a greater number of fractions is accomplished by redistillation.

Solvents in emulsion and diphasic cleaners, according to *S. Spring*, are generally of the hydrocarbon type. Although the solvent in emulsion cleaning is so well dispersed in water that a moderate flash point solvent (up to 180°F.) may be used safely, the hazard of the low flash point solvents commonly used in di-phase cleaning has limited the usefulness of this system. Flash point refers to the lowest temperature at which an oil gives off sufficient vapors to form an inflammable mixture with air. Fig. 158 shows the equipment used for determining flash point by the Cleveland Open Cup Method.

M. B. Diggin notes that there is a tendency at the present time, in the surface treatment of magnesium, to use emulsion cleaners in the precleaning cycle as a substitute for solvent degreasing. Such cleaners are essentially a mixture of emulsifying agents and hydrocarbon solvents. The basic ingredient of an emulsifiable solvent, according to *B. J. Sherwood*, is an organic solvent, usually a hydrocarbon, such as petroleum, kerosene, or naphtha. An emulsifying agent is included, one which is soluble in the hydrocarbon and will emulsify the mixture when it is rinsed in water. Usually, a fatty acid soap like potassium oleate is used. A blending agent of the higher alcohol or wetting agent group is added to provide a homogeneous and stable mixture of solvent and emulsifying agent. *W. Blum* and *G. B. Hogaboom* indicate that kerosene, a high-boiling hydrocarbon, is preferred in emulsion cleaning to chlorinated solvents because it is cheaper for remov-

ing greases, since most greases require a high temperature range to dissolve in oils or hydrocarbons. Addition of a wetting agent to the solvent (kerosene) aids, by emulsification in heated water, in removing the not very volatile hydrocarbon from the metal surface together with the grease. The authors also note that unsaponifiable oils and grease are hydrocarbons derived from petroleum, ranging from gasoline to lubricating oils and paraffin wax, and require removal by physical methods, such as the use of solvents, because they are hardly affected by chemical treatment.

Structural Formulas

The tendency of carbon atoms to join other carbon atoms as well as atoms of other elements, by forming shared electron bonds (covalent linkage) in chains of varying lengths or in rings, accounts for the large number of carbon compounds, including many with large molecular weights. Since the carbon atom contains four electrons in the outer orbit (valence of 4), each of these electrons can be shared by covalent linkage with a combining atom, as for example, an atom of hydrogen, which contains one electron. Four atoms of hydrogen with shared electron bonds (4 pairs) formed with an atom of carbon will give a completed shell of eight electrons, an arrangement resulting in the formation of the methane molecule, CH_4 .

The four electrons in the outer shell of the carbon atom may be conveniently represented by dots



The covalent (shared electron bond) for the methane molecule may be shown, accordingly, as follows:



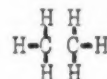
Any of the four bonds in this arrangement holds the same relationship to the carbon atom and may be represented as equidistant from the carbon atom, which is considered as occupying the center of a tetrahedron with valences directed toward the four corners. In the methane molecule the four hydrogen atoms, it is believed, occupy positions at the corners of the tetrahedron. In Fig. 159 this is represented as a three dimensional formula.

A simpler arrangement generally

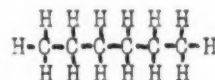
used to represent this structure adapts a two dimensional structural formula in which a short straight line represents the shared pair of electrons for covalent linkage. The conventional formula for methane, by this arrangement, would be



The structural formula for ethane, the next hydrocarbon compound in the paraffin series, C_2H_6 , in which two carbon atoms are linked together (covalent bond) would be represented by



and hexane the sixth member in this straight chain series, C_6H_{14} , a liquid, would be



Paraffin wax consists of a mixture of higher molecular weight hydrocarbons in the paraffin series, in which the straight chain for one of the molecules would consist of thirty carbon atoms ($\text{C}_{30}\text{H}_{62}$). Carbon atoms in a molecule, when joined by a single bond or a single pair of shared electrons, belong to a class of organic compounds that are classified as saturated compounds.

Substitution

Fluorine, chlorine, or bromine will

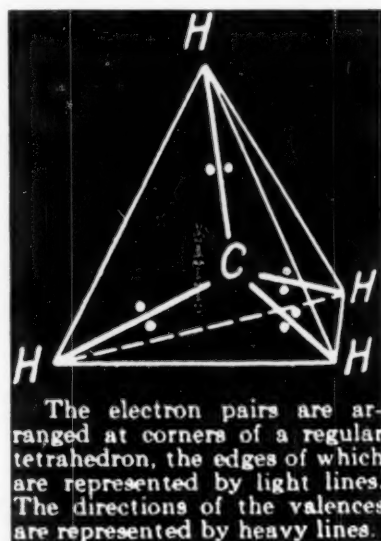
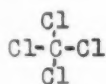


Fig. 159. The Methane Molecule.

react with methane. The reaction is extremely active with fluorine, even in darkness. Chlorine, when mixed with methane, is violently reactive in sunlight, bromine less so. Under controlled conditions, as in diffused light or low temperatures, chlorine can replace one or all of the hydrogen atoms in the methane molecule. A chlorine atom will, therefore, be substituted for a hydrogen atom, a change called substitution, and the chlorine compounds thus formed are called substitution products of methane, a characteristic reaction for the saturated hydrocarbons.

The chlorine-containing compounds of methane are named as follows: CH_3Cl , monochloromethane or methyl chloride; CH_2Cl_2 , dichloromethane or methylene chloride; CHCl_3 , trichloromethane or chloroform; CCl_4 , tetrachloromethane or carbon tetrachloride. The structural formula for CCl_4 is



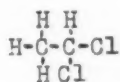
Chlorinated hydrocarbons are used extensively by industrial finishing industries for solvent and vapor degreasing because such compounds are nonflammable, possess the highest affinity for oils and greases, are rapid, and require a minimum of floor space. For example, methylene chloride, CH_2Cl_2 , is used to a limited extent in degreasing machines. It is especially effective for cleaning prior to gauging, since the higher boiling temperatures of trichlorethylene would affect the measurements. A mixture of methylene chloride and trichlorethylene is also used in a quick dip cycle to remove excess filler from impregnated castings before the baking cycle. Reference has been made to the use of methylene chloride for stripping formulations based on this compound, for thorough removal of alkyd and epoxy resin finishes on refrigerator cabinet rejects before reprocessing. It is non-flammable, carries a low toxicity rating, and is an effective flash and fire point depressant for use in mixtures with flammable solvents for cold cleaning operations. It is also recommended for vapor-degreasing where high temperatures of other vapor degreasing agents are objectionable.

Carbon tetrachloride is one of the effective non-flammable solvents, an advantage over the hydrocarbons which present a fire hazard. The tox-

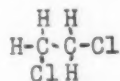
icity of this solvent, however, and the cost, require especially designed vapor degreasing equipment to make it economically suitable for use, through recovery of chlorinated solvents by distillation. Appreciable losses result, however, by evaporation and drag-out. Another factor that must be considered in the use of chlorinated solvents is the corrosive action on metals resulting from hydrolysis if proper precautions are not exercised.

Isomers

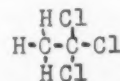
Substitution products have been introduced for the next higher hydrocarbon, ethane, C_2H_6 . Although only one monosubstitution is possible, the substitution of two or more atoms or groups will result in the formation of more than one compound having the same molecular and percentage composition but different physical and chemical properties. This is due to the difference in arrangement of the attached atoms. For example, consideration of disubstitution products of ethane shows that two compounds, dichlorethane, $\text{C}_2\text{H}_4\text{Cl}_2$, are possible, because both chlorine atoms may be attached to the same carbon atom,



or each chlorine atom may be attached to a different atom,

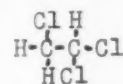


When two or more such compounds are known, possessing the same molecular formula, but differing in physical and chemical properties, the individual compounds are called isomers. Of the two trichlorethane isomers, $\text{C}_2\text{H}_3\text{Cl}_3$ possible, the (inhibited) 1, 1, 1-trichlorethane,



is mentioned in METAL FINISHING, as a very efficient, fast working, cold degreasing solvent that may be suitably used for spray, dip, wipe, or bucket operations. It has no flash (or fire) point, and the low corrosive effect permits its use with common metals. The numbers 1, 1, 1 preceding the naming of the compound trichlorethane indicates that the three chlorine atoms are

attached to the same carbon atom. For the other isomer (1, 2, 2) two chlorine atoms are attached to one of the carbon atoms and the third chlorine atom is attached to the second carbon atom



With increase in the molecular weight of the hydrocarbons, variation in arrangement of substituted atoms (or groups) will increase the number of isomers possible. Thus hexane C_6H_{14} has five isomers and, for octane, C_8H_{18} , the number of isomers possible increases to eighteen.

The carbon atoms in the hydrocarbon may be arranged in a straight chain, as in butane when it is classified as normal or n-butane; or the carbon atoms (in butane) may be branched. The prefix "iso" for isobutane is used to designate this branched chain type isomer. The iso type isomers would have a branched chain at one end only,

such as $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3-\text{CH}-\text{CH}_2-\text{CH}_3 \end{array}$, with the rest of the chain normal.

I.U.C. System

To avoid the confusion that would necessarily arise in providing distinctive names for the extensive list of saturated hydrocarbon isomers, a system has been established by the International Union of Chemists (I.U.C.), a modification of the Geneva system, for the naming of individual compounds. By this order the longest straight chain arrangement of carbon atoms is selected and the carbon atoms are numbered consecutively. Thus, a compound represented by the structural formula containing 6 carbon atoms in a straight chain and two groups of radicals as side chains, e.g.,

1 2 3 4 5 6
 $\text{CH}_3-\text{CH}-\text{CH}_2-\text{CH}-\text{CH}_2-\text{CH}_3$, would be

$\begin{array}{c} \text{CH}_3 \quad \text{C}_2\text{H}_5 \\ | \quad | \\ \text{CH}_3-\text{CH}-\text{CH}_2-\text{CH}-\text{CH}_2-\text{CH}_3 \end{array}$ named 2-methyl, 4-ethylhexane, indicating that the methyl, CH_3 , group is attached to the second carbon atom and the ethyl, C_2H_5 group is attached to the fourth carbon atom. The formula for this compound (isomer) would be C_9H_{20} .

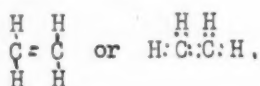
The general procedure for naming the saturated paraffin hydrocarbons is as follows: the name of a paraffin compound always ends with the suffix -ane, like methane, propane, octane; a single

bond is used for the compounds in this series because hydrocarbons are saturated; the first four members are gases; compounds containing from five carbon atoms (C_5H_{12}) to sixteen carbon atoms ($C_{16}H_{34}$) are liquids (room temperature) and those of higher molecular weights (up to $C_{60}H_{122}$) are solids; melting and boiling points show corresponding increases with increasing molecular weight; the name of the radical is obtained by changing the suffix -ane of the hydrocarbon to -yl; thus, methane CH_4 , becomes methyl, $-CH_3$; ethane, C_2H_6 , changes to the radical ethyl, $-C_2H_5$, whence it is observed that the radical contains one hydrogen less (has a valence of 1) than the corresponding hydrocarbon. The paraffin compounds are also known as alkanes, and the radicals or groups, like CH_3 , C_2H_5 , etc., are called alkyl groups.

Unsaturated Hydrocarbons

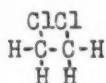
Unlike the saturated hydrocarbons, in which the carbon atoms are joined to each other by a single bond, another branch of hydrocarbon exists in which the carbon atoms are joined by double or triple bonds, because such compounds contain fewer hydrogen atoms for the same number of carbon atoms in a molecule than compounds of the paraffin series. These are known and classified as unsaturated compounds. Whereas, an atom or group can only be introduced in the saturated compounds by substitution, introduction of atoms or groups in the unsaturated compounds is possible by addition, that is without replacing others. One such series, containing the double bond, is the olefin (or oil forming) series, so called because the simple member ethylene, C_2H_4 , with two less hydrogen atoms in the molecule than the number in the saturated hydrocarbon, ethane, C_2H_6 , combines with chlorine to form an oil, ethylene dichloride, $C_2H_4Cl_2$.

The structural formula for ethylene in which the double bond is shown is as follows:



The addition of chlorine to ethylene at 0°C . to form ethylene dichloride or 1,2 dichlorethane will result in opening the double bond joining the carbon atoms; in its place a chlorine atom becomes attached to each carbon atom.

$C_2H_4 + Cl_2 \rightarrow CH_2ClCH_2Cl$, or structurally



In naming compounds of the olefin series, based on the I.U.C. system, the suffix -ane used for compounds in the paraffin hydrocarbons is changed to the ending -ene. Ethane, C_2H_6 , becomes ethylene or ethene C_2H_4 ; propane, C_3H_8 , becomes propylene or propene, C_3H_6 . The greater reactivity of ethylene compared to ethane is attributed to the greater energy content in the double bond.

Another series of unsaturated hydrocarbons, the acetylene series, contains two less hydrogen atoms than the corresponding olefin and is therefore more unsaturated. A triple bond is required between the two carbon atoms; hence acetylene, the first member with the formula C_2H_2 or $HC \equiv CH$, will correspond to the olefin ethylene, C_2H_4 . Addition products, as with ethylene, are therefore possible and, since it is more unsaturated, four chlorine or bromine atoms may be attached with two of the three bonds being broken. Compounds of the acetylene series, because of the greater degree of unsaturation (triple bond), exhibit greater reactivity than the corresponding unsaturated olefin hydrocarbons, such as ethylene C_2H_4 .

The next higher member of the acetylene series, with three carbon atoms and corresponding to propylene, is called propyne or methylacetylene, C_3H_4 , which is represented by the structural formula $CH_3C \equiv CH$. This is isomeric with propadiene, C_3H_4 , containing two double bonds and represented as follows: $CH_2=C=CH_2$. It will be noted that the name of a compound with a single bond has the ending -ene, whereas for compounds containing two double bonds the ending -diene is used. Such compounds are known as diolefins. Butadiene (1,3)

Trichlorethylene, C_2HCl_3 , a stabil-

ized chlorinated organic solvent,



vapor degreasing, is prepared from chlorine and acetylene. Its preferred use in vapor degreasing operations is due to the favorable physical properties of this compound. Thus, the liquid with no flash point is considered non-flammable at room temperature and moderately flammable at higher temperatures; the vapors are 4.5 times heavier than air, resulting in a minimum loss of vapors when used in vapor degreasing units, so that down draft is suggested for ventilation. A low boiling point (87°C .) enables vaporization without the need of too much steam for heating. Thermal properties such as specific heat and latent heat of vaporization allow economic operation in vapor degreasing. Hence a specific heat of 0.225 for the trichlorethylene indicates that the amount of heat removed in cooling is only about one-fourth that required for the same quantity of water; and the low value of latent heat of vaporization (103 btu per pound) is about one-tenth the quantity of heat exchanged in boiling or condensing water.

Stabilizing agents must be added to trichlorethylene to avoid decomposition, which occurs at higher temperatures, or if exposed to light. It is considered quite resistant to hydrolysis in the presence of water. Decomposition is attributed to oxidation. A gallon of trichlorethylene weighs about 12¼ pounds. The compound, however, has a relatively high vapor pressure at room temperature, about three times that of water, so that appreciable losses will occur if steps are not taken to prevent evaporation.

Perchlorethylene or tetrachlorethylene, CCl_2CCl_2 , is used as a solvent especially when excess moisture appears on the parts, and the operation is concerned primarily with drying without leaving water spots. Such procedure, especially in small plants lacking facilities for deionizing water, entails rinsing the finished work in water containing a wetting agent, followed by immersion in boiling (121°C .) perchlorethylene. The water vaporizes instantly at that high temperature without spotting.

PHOSPHATING TREATMENTS

A COMPREHENSIVE PATENT LITERATURE SURVEY

PART II

76. *Coating of Metal Sheets.* By Parker Rust Proof Co. (Pyrene Co. Ltd.) British 557,846. December 8, 1943.

A sheet having a surface of Fe, Zn or Cd or an alloy of Fe, Zn or Cd is treated before painting or forming into articles by coating it with a phosphate solution to produce a thin coating weighing less than 150 mg. per sq. ft. The metal may then be bent and stamped without powdering the coating.

77. *Compositions for Activating Metal and Alloy Metal Surfaces to Improve the Process of Forming on Them Corrosion-Resistant Coating.* By Westinghouse Electric International Co. British 560,847. April 24, 1944.

The composition is prepared by dissolving in water at least 80% of di-Na orthophosphate and up to 20% of a water soluble Ti compound and evaporate to dryness. The dried composition of di-Na orthophosphate and Ti compound when dissolved in water gives a solution for application to the metal or alloy surfaces.

78. *Phosphate Coatings on the Surface of Metals and Alloys.* By Westinghouse Electric International Co. British 560,848. April 24, 1944.

Prior to the application of a coating, the metal or alloy metal surface is activated by applying to it an aqueous solution containing 0.1-2% di-Na orthophosphate and preferably 0.005-0.05% of Ti ions in solution.

79. *Chemical Coatings on Metal Surfaces.* By The Pyrene Co. Ltd. British 561,504. May 23, 1944.

A corrosion-resistant and paint holding coating is produced on a metal surface by the chemical reaction of a phosphate solution with the surface. The coating action is accelerated by subjecting each part of the surface to pressure applied by yielding members while the coating solution is acting on that part.

80. *Corrosion Resistant Phosphate Coatings.* By Westinghouse Electric International Co. British 564,521. October 2, 1944.

The metal and alloy surfaces to which the corrosion resistant coating are to be applied are previously activated by applying to them an aqueous solution of di-alkali metal phosphate and one or more water soluble salts of Pb, Sn and As. The basic activating solution is that of Na_2HPO_4 . The solution is evaporated to dryness and redissolved for application.

81. *Corrosion Resistant Phosphate Coatings.* By Westinghouse Electric International Co. British 564,522. October 2, 1944.

The same as 564,521 except that the basic activating solution is that of Na_2HPO_4 . The

solution is evaporated to dryness and redissolved for application.

82. *Phosphate Coatings on Metals.* By Wilfred J. Clifford and Henry H. Adams. British 566,094. December 13, 1944.

This is a modification of British 510,684. Nitroguanidine, O-nitraniline, and o-, m-, and p-nitrobenzoic acid, which are used as accelerating agents in phosphate coating processes, are mixed in powdered form with the phosphate powder particularly $\text{Zn}_2(\text{H}_2\text{PO}_4)_2$. The keeping properties of the mixture are thus improved.

83. *Protection of Metallic Surfaces.* By Horace C. Hall. British 566,306. December 21, 1944.

The metal surface is immersed in a 40-80% by weight aqueous solution of H_3PO_4 at 10-110°F. and baked at 350-600°F. for 0.25-2 hours, the time varying inversely with the temperature. The phosphate coat is then protected from local breakdown by immersing the surface in a sodium silicate syrup at 70-105°F. for at least 5 minutes and baking it at 180-300°F.

84. *A Cleaning Composition for Metal Surfaces.* By American Chemical Paint Co. British 571,976. September 18, 1945.

A concentrated, dilutable metal cleaning composition includes H_3PO_4 and a water soluble, nonionic emulsifying agent consisting of a compound of the formula $\text{R.O.}(\text{C}_2\text{H}_5\text{O})_n\text{R}$, in which R stands for an alkyl, acryl radical containing at least 10 C atoms.

85. *Rustproofing.* By W. H. Allen. Canadian 178,793. August 21, 1917.

The surface of iron or steel rendered rust proof by immersing in a solution of $\text{Ca}(\text{H}_2\text{PO}_4)_2$ in the presence of a hydrated inorganic oxide in water.

86. *Rustproofing.* By W. H. Allen. Canadian 178,794. August 21, 1917.

The iron or steel is immersed in a phosphoric acid solution of a manganese phosphate.

87. *Rustproofing.* By W. H. Allen. Canadian 178,795. August 21, 1917.

The iron or steel is immersed in a solution of ferric acid phosphate.

88. *Rustproofing.* By W. E. Quin. Canadian 178,907. August 28, 1917.

The iron or steel is placed in a pickling solution of phosphoric acid to remove the scale and other insoluble oxides and then immediately submerged in a rust proofing bath.

89. *Coating for Protecting Metal.* By D. C. Westerfield. Canadian 183,534. April 16, 1918.

The coating consists of phosphoric acid, shellac, acetone and water.

90. *Rustproofing.* By Matthew Green & Hobart H. Willard (Parker Rustproofing Co.). Canadian 281,317. June 26, 1928.

Immerse articles in a bath containing a dilute solution of phosphoric acid and dihydrogen phosphates of iron and manganese, there being one-third as much manganese as iron in the solution, and sufficient dihydrogen phosphate proportion to free acid to rustproof the articles without reducing their weight.

91. *Composition for Cleaning Metal.* By James H. Gravell. Canadian 305,576. November 11, 1930.

A material for preparing metal for paint consists of an admixture of H_3PO_4 , EtOH, BuOH, water and raw starch.

92. *Metal Coating-Material.* By James H. Gravell. Canadian 306,870. December 23, 1930.

A material for coating metal consists of an admixture of naphtha and kerosene, stearin pitch, H_3PO_4 , and lampblack.

93. *Metal-Coating Composition.* By Robert R. Tanner and Van M. Darsey (Parker Rust Proof Co.). Canadian 306,997. December 23, 1930.

Iron or zinc is treated with a hot, weak solution of phosphates of Mn, Fe and Cu, the solution being substantially free from acids stronger than phosphoric or salts thereof. After washing and drying, the surfaces may be coated with paint or enamel.

94. *Rust-Resistings Coating Composition.* By Herbert O. Albrecht (Canadian Industries Ltd.) Canadian 336,447. October 17, 1933.

Rust resisting coating composition is manufactured by mixing phosphoric acid and BuOH with a coating composition of the paint or varnish type.

95. *Phosphate Coatings on Iron and Steel.* By John S. Thompson and Van M. Darsey (Metal Finishing Research Corp.). Canadian 351,060. June 18, 1935.

A phosphate coating bath is replenished by a material consisting essentially of $\text{Mn}(\text{NO}_3)_2$ and $\text{Mn}(\text{H}_2\text{PO}_4)_2$ or $\text{Mn}_3(\text{PO}_4)_2$. An example of the original solution is NaNO_3 100 and $\text{Mn}(\text{H}_2\text{PO}_4)_2$ 115 lbs. in which about 19 grams of CuCO_3 may be added, dissolved at the rate of 35-50 lbs. of mixture in 100 gals. of water.

96. *Cleaning Agent for Metals That Are to be Painted.* By Clete L. Boyle. Canadian 356,078. February 25, 1936.

A mixture of an acid, such as H_3PO_4 , an oil solvent, such as monobutyl ether or ethylene glycol, and a compatible wetting agent such as a soluble salt of an alkylated naphthalene sulfonic acid is specified. The wetting agent functions in the acid solution and promotes dispersion of the solution over the metal surface.

97. *Solution for Phosphating of Iron and Steel.* By Dansk Fosfaterings Industri Aktieselskab. Danish 79,760. August 29, 1955.

Besides phosphates, the solution contains nitrates and nitrites to obtain a finer-grained and more uniform coating. These compounds also make it possible to use a lower temperature in the coating bath.

98. *Rustless Iron or Steel by Phosphoric Acid and Zinc*. By V. V. Gruno and Adek Rijwielen Fabrieken. Dutch 53,993. February 15, 1943.

The cleaned article is dipped in a solution containing Zn, H_3PO_4 , and glycerol, e.g., water 110 liters is mixed with a dough of H_3PO_4 833 grms, and Zn 300 grms, and allowed to stand some hours. The glycerol 28° Be 143 grms, is added. The bath is used at 95° for 12 minutes.

99. *Phosphating Bath for Protecting Iron Articles from Rust*. By Products Chimieuz T.B.I. (add to French 836,140). French 50,154. January 17, 1940.

The pH of the bath is maintained at a value ranging from 2.8 to 4 by adding an alkali or an albuminous material. A suitable phosphating composition contains Mn phosphate, an NH_4 salt, alizarin, or hydroxyquinoline, an alkali or an albuminous material a noble metal, such as Ag or Pt, a thickening agent and BuOH.

100. *Treatment of Iron or Steel for Preventing Oxidation or Rusting*. French 276,536. April 8, 1907.

(See British 490.)

101. *Treatment of Iron or Steel to Prevent Rusting or Oxidation*. By T. W. Costlett. French 432,241. December 1, 1910.

(See British 28,131.)

102. *Treatment of Iron & Steel for Preventing Oxidation or Rusting*. By R. G. Richards. French 446,701. August 31, 1912.

(See British 17,563.)

103. *Process for Protecting Objects Against Rust*. By M. Green and H. H. Willard (Parker Rust Proof Co.). French 632,341. April 7, 1927.

(See British 270,679.)

104. *Coating Iron or Steel With Phosphates*. By Parker Rust Proof Co. French 632,342. April 7, 1927.

Iron and steel are coated with phosphates of iron and manganese, the content of manganese in the coating being at least half the content of iron and the relation of metal to phosphate being 6 atoms of the former to 5 of the latter. The iron objects to be coated are placed in a dilute solution of phosphoric acid and the phosphates.

105. *Process for Protecting Objects Against Rust*. By M. Green and H. H. Willard (Parker Rust Proof Co.). French 632,341. January 17, 1928.

(See British 270,679.)

106. *Rust Preventing*. By William H. Cole. French 647,314. December 26, 1927.

Iron and steel are protected against rust by treating them with a solution containing phosphates of either Al, Zn, Fe or Cr.

107. *Rust-Preventing*. By William H. Cole. French 648,106. February 2, 1928.

The process for proofing iron and steel against rust by treating it with a solution of phosphates of Al, Zn, Fe or Cr is carried out under pressure at a temperature above the boiling point of the liquor in a stationary or movable autoclave.

108. *Covering Metals*. By Societe Continentale Parker. French 680,946. August 29, 1929. German 641,750. February 12, 1937.

Iron or zinc is coated by subjecting it to

the action of a warm weak solution of phosphate of a metal as basic as Fe and a smaller quantity of a phosphate of a metal less basic than Fe (for example) Cu. Washing, drying and finally coating with paint or enamel.

109. *Coating Surfaces*. By Societe Continentale Parker. French 683,486. October 18, 1929.

A surface is coated by depositing thereon electrolytically a layer of Fe which is then treated with a solution of phosphates until a layer of insoluble phosphates has been formed on the surface of the article.

110. *Cleaning Metallic Surfaces*. By James H. Gravell. French 695,914. May 21, 1930.

Metallic surfaces are exposed to the action of a solution which contains a compound of H_3PO_4 , one atom of H of which is replaced by a metal or radical such as NaH_2PO_4 or $NH_4H_2PO_4$.

111. *Rust-Preventing*. By I. G. Farbenindustrie A. G. French 698,878. July 12, 1930.

Antirust baths for Fe or steel objects are prepared by introducing Mn CO_3 at ordinary or slightly raised temperature into dilute phosphoric acid until the insoluble phosphates begin to form, and, if necessary, diluting the solution thus obtained with water.

112. *Coating Metals*. By James H. Gravell. French 698,986. July 10, 1930.

Coatings for preventing corrosion on metals contains, e.g. stearic pitch 105.3, orthophosphoric acid 4.54 Kgs., solvent naphtha 155 liters and petroleum 100.8 liters.

113. *Coating Metals*. By Metal Finishing Corporation. French 724,422. October 7, 1931. British 386,739. January 26, 1933.

Metals are dipped into a solution of an acid phosphate by reaction with the metal, and the H formed is removed as it is formed by means of an oxidizing agent such as an alkali or alkaline earth nitrate.

114. *Coating Iron*. By Aladar Pacz. French 728,364. December 17, 1931.

Fe and steel are protected against corrosion by a coating containing insoluble phosphates of heavy metals, preferably tertiary phosphates of Fe and Mn, and oxide of Mn.

115. *Coating Iron*. By Aladar Pacz. French 728,411. December 18, 1931.

Fe and steel are protected against corrosion by a coating containing a mixture of metallic phosphates of Fe and Mn, and soluble salts of Zn or Cd, other than phosphates.

116. *Anti-Rust Products*. By Robert Burstenbinder and Ernest Eppendahl. French 755,805. November 30, 1933.

An anti-rust destroying product is composed of a binder, e.g. as varnish insoluble in water and drying in air, and a mixture solution in this binder, of an acid attacking the metal, such as H_3PO_4 and constituents precipitating from metallic solutions, e.g. tannic acid, benzoic acid, or their salts, esters or other compounds.

117. *Protecting Iron*. By Oliver Battini. French 770,617. September 17, 1934.

Anti-rust solutions for Fe, etc. contain double or triple phosphates, the principal metal being manganese, the others playing

the part of catalysts being in small amounts even traces.

118. *Process for Rust Protection*. By I. G. Farbenindustrie A. G. French 773,554. November 23, 1934.

The solution contains manganous hyperphosphate and zinc dust.

119. *Process for Protecting Articles from Rusting by a Phosphate Coating*. By I. G. Farbenindustrie A. G. French 776,042. January 15, 1935.

To a compound consisting of hyperphosphates, small quantities of organic nitrogenous compounds such as toluidine, quinoline, pyridine, etc. are added.

120. *Rust Preventing*. By Victor Chemical Works. French 788,036. October 2, 1935. British 447,704. May 25, 1936.

Fe is protected against rust by treating it with an aqueous solution of a hexivalent Cr compound (chromates, dichromates, chromic acid and anhydride) and H_3PO_4 and then drying. The ratio of e.g. dichromate to H_3PO_4 is about 25 to 100 and the concentration of the H_3PO_4 about 10-20%.

121. *Cleaning Metals*. By Rust Proofing Company of Canada, Ltd. French 797,098. April 20, 1936. British 464,892. April 26, 1937.

Metals such as Fe, Cu and Al are cleaned and freed from rust by dipping in fused alkali nitrates, phosphates, carbonates or hydroxides, with or without the addition of a flux such as MnO_2 and then subjected to the action of a neutralizing agent such as Fe sulfate, HCL or $(COOH)_2$ in aqueous solution.

122. *Surface Treating Iron*. By Societe Continentale Parker (Metallgesellschaft A. G.). French 805,845. December 1, 1936.

Fe is treated to prevent rusting in a bath, the principal constituent of which is Zn phosphate and the bath is regenerated by a solution containing Zn phosphate and Zn nitrate. The ratio of aqueous P_2O_5 and NO_3 in the regenerating solution is between 2.5:1 and 1.5:1. The initial solution may also contain a nitrate preferably $Zn(NO_3)_2$ the ratio of P_2O_5 to NO_3 being about 1:1. The bath may contain a small amount of Cu or Sn and Ni.

123. *Protecting Metals*. By American Chemical Paint Co. French 817,993. September 15, 1937.

In protecting metals such as Fe, Zn and Cd by acid aqueous solutions of phosphates, the surface to be coated is brought into violent contact with the solution. The contact is obtained by a mechanical action corresponding to a relative speed of impact if at least 5 m. per second. The liquid may be projected by high pressure through a jet.

124. *Acid Baths Used In Metallurgy*. By Rene J. Kahn. French 829,686. July 4, 1938.

(See British 507,355.)

125. *Surface Treatment of Metal Articles*. By Societe Continentale Parker. French 835,312. December 19, 1938.

The metal articles are immersed in a vat containing an acid solution of a phosphate in which the principal active coating agents do not oxidize in the air. The phosphate solution is aerated by removing it from the vat and returning it through the air. Phosphates

of iron are thus removed from the solution by precipitation. The solution may contain Zn, Mn, Cd or Ca dihydrogen phosphate.

126. *Phosphating Composition for Protecting Iron Articles*. By Products Chimiques T. B. I. French 836,140. January 11, 1939.

The composition comprises of Mn phosphate and an NH_4 or amine salt, a compound containing the group $-\text{COC}-\text{C}(\text{OH})=$ or $=\text{N}-\text{C}-\text{C}(\text{OH})$. An example: a salt of alizarin or hydroxyquinoline or a derivative thereof. The composition may also contain Fe or Zn phosphate.

127. *Phosphate Coating Solutions on Ferrous Metals*. By American Chemical Paint Co. French 847,128. October 3, 1939. (See U. S. 2,186,177.)

128. *Phosphatizing Baths for Treating Metals*. By Rene J. Kahn. French 851,541. January 10, 1940.

The harmful chemical reactions produced inside the bath are neutralized by adding regularly during the treatment a basic product, preferably of an alkaline character such as a salt of an alkali metal or a salt of a metal and a weak acid e.g., manganese carbonate. Phosphatizing accelerators, such as a salt of hyposulfurous acid, are added to the bath.

129. *Antirusting Steel*. By Societe Continentale Parker. French 971,926. January 23, 1951.

Iron alloys are protected against rust by treating them with a solution consisting of (1) 6.65 grams HNO_3 , 10 grams H_3PO_4 , and 6.75 Zn/liter; (2) 25 grams Zn monophosphates, 27 grams NaNO_3 and 7 grams zinc phosphates per liter. The operating temperature is 70-80° for 1-20 minutes.

130. *Electric Resistance Consisting of Metal-Phosphate Layers Applied on Metal Bodies*. By G. Bauknecht (G. M. bh). German 809,831. August 2, 1952.

Detail description of the comparison of electric resistance with the amount of phosphate coating applied on metal bodies.

131. *Process for De-Rusting*. By A. Brown and W. P. Brown. German 6,968. April, 1879.

The ferrous objects are immersed into solutions consisting of 400-500 grams of di-phosphate of sodium and ammonium dissolved in 4-5 liters of water.

132. *Preparation of Rust Proofing Phosphate Coatings on Iron Objects*. By H. Weidman, G. Roesner, W. Overath (Metallgesellschaft A. G.). German 60,619. November 24, 1934.

To any phosphate solution, 0.5-5 grams/liter ferro-silicic acid is added.

133. *Treatment of Iron or Steel for Preventing Oxidation or Rusting*. By Rudge Whitworth and H. L. Heathcote. German 209,805. May 10, 1909.

Parts are immersed in a mixture of iron phosphates with other phosphates not specified.

134. *Method of Obtaining A Rust-Preventing Coating on Iron or Steel*. By A. D. Libeski. German 229,173. April 9, 1909.

The objects are heated to 150-200°C and then immersed into diluted solution composed of H_3PO_4 , ferric chloride and calcium salts.

135. *Treatment of Iron or Steel to Prevent Rusting or Oxidation*. By T. W. Coslett. German 248,856. December 2, 1910. (See British 28,131.)

136. *Treatment of Iron and Steel for Preventing Oxidation or Rusting*. By R. G. Richards. German 265,249. October 4, 1913. (See British 17,563.)

137. *Process for the Preparation of a Rust Proof Layer of Phosphate on Objects of Iron and Steel*. By H. Arnold. German 305,677. March 2, 1920.

The objects are treated with a concentrated solution of phosphoric acid, phosphates having a given degree of acidity for definite purposes. This acidity may be obtained through the additions of H_2SO_4 .

138. *A Process for Obtaining a Rust Resistant Layer on Iron and Steel*. By W. Schmidding. German 310,756. July 1, 1922.

Same solution as German 313,578 plus hydrogen peroxide or potassium chlorate.

139. *Process for Preparing Rust Proof Layer on Iron and Steel by Phosphoric Acid at Boiling Temperature*. By W. Schmidding. German 313,578. July 15, 1919.

The solution contains phosphoric acid, calcium and zinc, and is mixed with metallic oxides and water.

140. *Process for Producing a Rust Proof Layer on Iron or Steel*. By W. Schmidding. German 448,009. August 5, 1927.

The surface of the metal parts is treated with a diluted solution of phosphoric acid, hydrogen peroxide, and potassium chlorate.

141. *Treatment of Iron and Steel for Preventing Oxidation or Rusting*. By T. W. Coslett. German 457,729. March 24, 1928.

The parts are immersed into a solution of zinc phosphate containing borax or boric acid.

142. *Cleaning Metals*. By George Buttner (I. G. Farbenind A-G). German 493,743. March 1, 1928.

Oxide coatings such as rust or tarnish, are removed from metal surfaces by treating them with a solution of H_3PO_4 and cyclohexanol.

143. *Protecting Iron from Rust*. By William H. Cole. German 496,933. December 25, 1927.

Iron and Fe-C are protected from rusting by treating with a mixed solution of phosphates of Al, Zn, Fe and Cr. $(\text{NH}_4)_2\text{HPO}_4$, Na_2BO_3 or $\text{K}_2\text{Cr}_2\text{O}_7$ may also be added.

144. *Process of Corrosion Protection of Objects Containing Iron or Steel*. By M. Green and H. H. Willard (Parker Rust Proof Co.). German 504,198. August 6, 1930.

(See British 270,679.)

145. *Stainless Metal Coatings*. By N. V. Maatschappij Tot Exploitatie Van Der Parker Octrooien "Parker Rust Proof". German 508,785. April 14, 1927.

A stainless iron-manganese coating is given to iron and steel objects by immersing the latter in a bath containing MnO_2 , H_3PO_4 and manganese phosphates, the proportion

of phosphates being adjusted so that the Mn content of the final stainless coating is at least $\frac{1}{2}$ of the Fe content.

146. *Coating Metals to Prevent Corrosion*. By J. H. Gravell. German 561,443. June 19, 1930.

(See British 355,286.)

147. *Rustproofing*. By N. V. Maatschappij Tot Exploitatie Van Der Parker Octrooien "Parker Rust Proof". German 562,561. October 26, 1929.

Objects are given an intermediate coating of Fe by electrolytic precipitation and then treated with phosphate solution to give a final coating of insoluble phosphate.

148. *Protecting Metals Against Rust*. By N. V. Maatschappij Tot Exploitatie Van Der Parker Octrooien "Parker Rust Proof". German 564,361. February 13, 1929.

In the known process in which the metal is superficially phosphatized and then treated with oil, an improvement is obtained by adding to the oil a substance capable of swelling e.g., gelatin.

149. *Rust Preventing Coatings*. By N. V. Maatschappij Tot Exploitatie Van Der Parker Octrooien "Parker Rust Proof". German 570,990. February 22, 1933.

Fe and Fe-C objects are protected against rust by treating with a solution of acid phosphates of metal such as Fe, Mn or Zn, which produce an insoluble phosphate coating on the object, and with colloidal SiO_2 .

150. *Protecting Iron Against Rust*. By N. V. Maatschappij Tot Exploitatie Van Der Parker Octrooien "Parker Rust Proof". German 583,349. September 1, 1933.

Fe articles after treatment in known manner in a phosphate bath containing a compound of a less electropositive metal, e.g., Cu, are treated with a chromate solution or with a solution containing 1-3 g./l. of CrO_3 .

151. *Process for Preparation of Corrosion-Resistant Coatings on Iron or Steel*. By A. Pacz. German 584,411. September 20, 1933.

The objects are immersed for about 15 minutes in a hot solution of metallic hyperphosphates containing a compound of molybdenum.

152. *Phosphate Coatings on Iron*. By W. Overaths (Metallgesellschaft A. G.). German 597,365. May 25, 1934.

After being covered with a phosphate coating, the parts are immersed into a solution containing an easily hydrolyzable aluminum salt (Sulphate or Acetate).

154. *Rust Preventing Coatings*. By Hans Weidmann, Gerhard Roesner (Metallgesellschaft A. G.). German 616,982. April 1, 1941.

The coatings are formed on Fe and steel objects by hanging the objects in a bath containing phosphates of metals. Any Al present in the bath is removed before immersion of the Fe or steel objects. In an example, a bath of phosphate salts containing Mn, Fe, P_2O_5 and Al is used. The Al is removed by adding colloidal $\text{Fe}(\text{OH})_2$. Other examples are given.

155. *Covering Metals*. By Societe Continentale Parker. German 641,750. February 12, 1937.

(See French 680,946.)

156. *Treating Metal Surfaces*. By N. V. Maatschappij Tot Exploitatie Van Der Parker Octrooien "Parker Rust Proof". German 643,389. April 19, 1937.

Fe, Mg, or Zn surfaces are rendered rust proof and colored by treatment with aqueous solutions or phosphates of Zn, Fe, or Mg. Containing also nitrate, preferably Cu (NO_3)₂. The coating may be after-oxidized.

157. *Phosphate Coatings Upon Iron and Steel* (Metallges. A. G.). By Gerhard Roesner and Ludwig Schuster. German 685,471. December 18, 1939.

Before treatment with a phosphate solution especially such as containing nitrate, the objects to be protected are prewashed with a solution containing nitrite. For example 1 to 5 grams NaNO_2 per liter of solution.

158. *A Rinse for Phosphate Coatings*. By Metallgesellschaft Akt-Ges. German 690,477. April 4, 1940.

Rinsing in a solution of 4-7 grams of acid chromates per 100 liters of water will protect phosphate coating from rust.

159. *Fine Crystalline Phosphate Layers on Zinc, Iron and Their Alloys*. By Gerhard Roesner and Walter Stenger (Metallgesellschaft Akt-Ges.).

Before phosphatizing the metals to be treated are steeped in an acidified Cu solution. The time of treatment in the Cu solution and the concentration of the latter is such that 40-70 mg. of Cu are precipitated per sq. in. of the treated metal.

160. *Pickling Solution for the Preparation of Metallic Surfaces for Anticorrosion Phosphate Coatings*. By Metallgesellschaft Akt-Ges. German 697,506. September 19, 1940.

The pickling solution must contain small percentage of H_3PO_4 in the solution. This cleans and activates the surface for the application of anti-corrosive phosphate solutions.

161. *Aftertreatment for Phosphated Iron and Zinc*. By Adolf Franz (Akt-Ges. fur Rost-Schutz). German 705,067. August 1953.

Phosphated Fe and Zn are treated for 10 min. in a bath containing heavy metal phosphates, preferably the same cation as the treated metal. The concentration of the phosphate is less than the one in the phosphating solution. A suitable bath for after-treatment is one containing Zn 1.6-2 and P_2O_5 —6.5-7 grms./liter and kept at 90°F.

162. *Corrosion-Resistant Layers On Metals Particularly on Fe and Steel*. By Robert R. Tanner and Robert V. Harris (Metallgesellschaft A.-G.). German 718,317. February 19, 1942.

An aqueous solution of H_3PO_4 and CrO_3 is applied on the metal and allowed to dry thereon. The strength of this is such that it visibly etches the metal. The ratio of H_3PO_4 to CrO_3 is 1 to not more than 0.25 and preferably 1 to not more than 0.15.

163. *Phosphate Coatings On Metals*. By William J. Clifford (Metallgesellschaft Akt-Ges.). (Addn. to German 685,471). German 718,870. February 26, 1942.

The procedure outlined in German 685,471 is applied to cases where the phosphate solution, preferably containing nitrate, is sprayed onto the metal.

164. *Corrosion-Resistant Coatings*. By Robert R. Tanner (Metallgesellschaft A.-G.). German 719,549. March 12, 1942.

To apply a corrosion-resistant coating on iron and steel, the latter is first treated in a solution containing a metal lower in the electromotive series than Fe and an acid that does not prevent the disposition of this metal on Fe or steel. The iron is then treated in a solution containing hexivalent Cr and the PO_4 radical. This solution is allowed to dry on the surface of the treated metal.

165. *Purification of Phosphate Baths Contaminated With Aluminum*. By Gerhard Roesner and Ludwig Schuster (Metallgesellschaft A.-G.). German 719,550. March 12, 1942.

To the phosphate baths for Zn-Al alloys is added an acid fluoride (fluosilicate). The amount added is approximately 2 grs./liter.

166. *Phosphatic Protecting Layers On Iron, Copper and Light Metals*. By Karl Schilling and Oscar Ritschel (Karl Schilling). German 721,507. April 30, 1942.

Before applying the protecting layer the metal is treated first anodically then cathodically in a cold solution of acid Ca or Mg phosphate at pH 3-4.5.

167. *Phosphate Films On Iron and Steel*. By Gerhard Roesner and Ludwig Schuster (Metallgesellschaft A.-G.). German 727,194. September 24, 1942.

The film is applied from a phosphate solution containing $\text{Zn}_3(\text{PO}_4)_2$ and NO_3 and H^+ ions. No other cations are present in the solution. The concentration of NO_3 in the solution is greater than that of P_2O_5 .

168. *Protecting Fe Surfaces Against Corrosion By Corrosive Water*. By Oscar Ritschel, Karl Schilling, Walter Wesley and Joseph Schaefer (Hella Ritschel). German 728,349. September 22, 1942.

The iron is treated in a solution of H_3PO_4 and an acid phosphate.

169. *Phosphate Coatings On Metals, Especially Steel and Iron*. By Gerhard Roesner, Ludwig Schuster and Robert Krause (Metallgesellschaft A.-G.). German 729,262. November 19, 1942.

The protective coating is applied by spraying a solution containing the ions H_2PO_4 , NO_3 , H, Zn and an alkali, preferably Na. The ratio of P_2O_5 : NO_3 in the solution is 1:2.5-1:4. This solution is augmented by another in which Zn is the predominant metal ion and the ratio of metal: P_2O_5 is 0.4-0.6:1: 0.4-0.6.

170. *Black Coating Preparation for Aftertreating Phosphated Surfaces*. By Ludwig Schuster (Metallgesellschaft A.-G.). German 729,723. November 26, 1942.

A black paint is made of trichloro-ethylene and alcohol 90-95%, a soluble organic dye 2-4 and a mixture of polyvinyl acetate and synthetic shellac 3-6 and preferably 4-5%.

171. *Apparatus for Automatic Surface Treating Such As Pickling, Scouring or Phosphating Small Objects*. By Karl Gebauer and Karl Schuch (Firnja Friedr Blasberg). German 731,044. December 24, 1942.

Constructional details only.

172. *Preventing Corrosion of Steam Installations*. By Ferdinand Killevald. German 738,121. July 1, 1943.

A block of sodium phosphate is placed in a steam pipe. The flowing steam strikes the phosphate and carries some of it away to deposit it on the walls of the steam line.

173. *Phosphatizing Iron or Steel*. By Philipp Siedler and Friedrich Rossteutscher (I.G. Farbenind. A.G.). German 741,100. September 16, 1943.

The metal surface to be phosphatized is cleaned and treated with a solution of a hydrophobic substance. Then the protective layer is applied from a bath containing primary heavy-metal phosphates and H_2SO_4 or a salt yielding H_2SO_4 .

174. *Phosphatizing Zinc or Its Alloys*. By Hellmut Ley, Gerhard Roesner, and Ludwig Schuster (Metallgesellschaft A.-G.). German 741,101. September 16, 1943.

Zn and its alloys are phosphatized in a phosphate solution in which Fe is treated at the same time.

175. *Preventing Contamination of Phosphating Solutions*. By Hans Dietrich von Schweinitz (Metallgesellschaft A.-G.). German 741,442. September 23, 1943.

To prevent contamination of phosphate solutions by Al in the process of phosphatizing Al-Zn alloys, the alloy is first treated in an alkali, preferably a NaOH solution to dissolve out Al from the surface.

176. *Phosphatic Coating On Metals, Especially On Iron and Steel*. By Ludwig Schuster and Robert Krause (Metallgesellschaft A.-G.). German 741,937. October 7, 1943.

The phosphate coating is applied from a phosphating solution at a temperature up to 50°F, preferably room temperature. The duration of the treatment is of the usual time. The content of the free acid is lowered from the quantity used formerly at higher temperatures to correspond to the new equilibrium.

177. *Rust-Inhibiting Phosphate Films On Metals*. By I. G. Farbenind. A.G. German 742,340. October 14, 1943.

The films are deposited on iron from baths containing primary metal phosphates. To these baths are added cyclic or heretocyclic basic nitrogenous substances, such as aniline, O- and p-toluidine, pyridine, quinoline, quinaldine, benzoin oxime or their mixture.

(To be continued)

SHOP PROBLEMS

BARREL FINISHING — POLISHING AND BUFFING
CLEANING — ANODIZING — ELECTROPLATING
RUSTPROOFING — LACQUERING AND ENAMELING



METAL FINISHING publishes, each month, a portion of the inquiries answered as a service to subscribers. If any reader disagrees with the answers or knows of better or more information on the problem discussed, the information will be gratefully received and the sender's name will be kept confidential, if desired.

Dip Coating for Matching Purposes

Question: We are in the market for a silicone resin or copolymer paint for dip coating the enclosed samples in order to match colored leather. We understand that a nonflammable paint containing 100% acrylic solids is also available and would appreciate receiving information regarding type of material we should use, how it should be applied, and suppliers who could furnish it.

D. M. G.

Answer: The service conditions to which the parts will be subjected do not warrant using either a silicone or acrylic material. Careful control of the viscosity, method and rate of removal, will assure proper paint application. We suggest you obtain specific information from a paint supplier (names enclosed).

Sealing Tin Plate

Question: We have a problem with rusting of tin plate parts in tropical areas where both temperature and humidity are high.

Do you have any information on a film and solvent type of solution that might be used to seal the pores of the plate and retard rusting? These parts are made of standard 30 lb. tin mill black plate coated with .75 lbs. of tin per base box. Preferably, the protective solution should be such that it will not discolor the tin plate and that it can be applied by an inexpensive process on location such as by tumbling in a standard tumbling barrel.

E. O. M.

Answer: The deposit thickness of 0.75 lb./base box is equivalent to less than 0.00005", so that much corrosion-

resistance should not be expected. A sealing treatment which has been employed for many years consists of immersion for a few seconds at 195-200 deg. F. in the following solution, followed by a rinse:

Sodium chromate	3 g./l.
Sodium hydroxide	10 "
Wetting agent	2 "

Zinc Removal from Nickel Baths

Question: We are bothered by the presence of contaminating metals, principally zinc, in a bright nickel plating solution which is some three years old. We know of removing them to some extent by plating out on dummies at a low current density but wondered if there might be some faster and more efficient method.

Is it possible to use some of the chelating agents, such as E D T A, to complex the unwanted metals? Any suggestions would be greatly appreciated.

L. E. C.

Answer: Chelating agents have been suggested for removal of metallic impurities from plating solutions. However, there seems to be quite a bit of disagreement as to the value of the method since reaction conditions must be carefully controlled to obtain precipitation of zinc and we have heard of troubles being experienced during subsequent operation of the nickel bath.

The electrolytic method is the safest, at present.

Lead-Indium Bearings

Question: This company is setting up an electroplating shop to supplement our engine overhaul operation. We are interested in the lead-indium plating process for engine bearings. We would

like to hear from you regarding the above operation.

S. Y. T.

Answer: Although lead-indium alloy plating baths have been reported in the literature, the usual practice in bearing production is to apply a lead coating, followed by indium plating. The indium is subsequently diffused into the lead deposit by heating.

Procedures for plating lead and indium will be found in any recent edition of the METAL FINISHING GUIDE-BOOK.

"Fused" Tin

Question: One of our customers has been requesting fused tin on their electronic parts. Just what is "fused" tin? There is no mention of this type of tin in your METAL FINISHING GUIDE-BOOK-DIRECTORY, and I wondered how fused tin would differ from electro-tin or hot dip tin.

My interpretation is heating electro-tin to a molten state to obtain this finish. Am I correct?

W. M.

Answer: Fused tin, sometimes called "flowed" tin, is produced by melting electrotin deposits. It has advantages such as better solderability and lesser tendency to fingerprint, as well as somewhat better corrosion resistance.

The flowing can be performed in palm oil, maintained at just above the melting point of tin, or in a number of proprietary mineral oils, which are obtainable from many of the large oil companies. Tallow is also used. On continuous tin plating lines for steel strip and sheet, the flowing is obtained by induction or resistance heating of the strip, or by radiant heat. In the case of electronic parts, the hot liquid method is, of course, preferable.

Cadmium vs. Zinc

Question: We manufacture electric cigarette vending machines which are used throughout the United States in all climatic conditions. We are interested in obtaining information regard-

ing the resistance to corrosion between bright zinc plating and cadmium plating on cold rolled steel.

Of particular value would be results of salt spray tests and any special procedure or formulae which are to be used for bright zinc plating that give high corrosion resistance.

M. G. Y.

Answer: The relative protective values of zinc and cadmium will vary with the type of exposure. Cadmium is much better than zinc, as respects salt spray resistance, while zinc will stand up better in industrial atmospheres.

The use of a chromate conversion coating on zinc will result in greatly increased resistance to formation of

white corrosion products, but will have only a moderate effect on the ultimate resistance to rusting of the steel base.

Terne Deposits

Question: I have been engaged on a research project on metal whisker growth on plated metals. One of the materials to be tested for such growth is plated terne metal. Unfortunately, I have not been able to find a suitable electroplating solution for terne. Perhaps you could be of assistance in supplying the necessary information. I would certainly appreciate any suggestions that you can make in this connection.

R. H. M.

Answer: Alloys of almost any ratio of lead to tin have been deposited from the fluoborate bath, by varying the solution composition and operating conditions. Information on the subject will be found in any recent edition of the METAL FINISHING GUIDEBOOK in the section on "Lead-Tin Alloy Plating."

Chemical Brightening Magnesium

Question: We would very much appreciate having information about literature concerning chemical brightening of magnesium.

G. R.

Answer: The only chemical brightening procedure for magnesium in our files is 5-10% by volume nitric acid, at room temperature, which was suggested by DeLong & Gross [Proc. American Electropl. Soc., pp. 110-17 (1942)].

Ductile Barrel Nickel

Question: We have the following dull nickel bath in present production:

Nickel sulfate 45-55 oz./gal.
Ammonium
chloride 3- 4 "
Boric acid 6- 8 "
Temperature 90-100° F.
pH 5.0-5.2
180-200 amperes at 11.5 volts per
14" x 30" barrel load of brass
keys.

Our problem is the lack of ductility of the deposit such that about 0.00015-0.00020" of nickel thickness is the maximum permissible. Otherwise cracking occurs in the subsequent coining operation.

Would you please recommend changes in solution composition or in operating conditions that may produce more ductile deposits?

E. J. M.

Answer: The deposit can be softened by operation at higher temperature and lower pH. We would suggest 125-135 deg. F. and a pH of about 4. Elimination of ammonium ion will also help, such as by use of a Watts formula.

Copper and zinc dissolving in the solution from brass parts dropped during loading and unloading will produce brittleness, so that parts should be removed from the tank bottom without delay and a regular schedule of electrolytic purification set up.

Professional Directory

TOMORROW'S PRODUCTS TESTED TODAY

A service to aid industry in producing longer-lasting and better-looking products. Quick predetermination of durability and permanency by actual exposure test in South Florida. Write us today for full information.

SOUTH FLORIDA TEST SERVICE
EST. 1931

4201 N. W. 7th St. Miami 44, Fla.

THE ANACHEM LABORATORIES

TESTING ANALYSES ENGINEERING
For Metal Finishers
Plating solution analyses and control. Testing of deposit-thickness, composition porosity, tensile strength. Salt Spray tests.

AIR FORCE CERTIFICATION TESTS
1724 West 58th St., Los Angeles 62, Calif.
AXminster 4-1262

ERNEST J. HINTERLEITNER

5340 RIMPAU BOULEVARD
LOS ANGELES 43, CALIFORNIA

AXminster 4-1531
Research - Engineering - Consulting
1926/1955 - U.S.A. and Foreign

PLATERS

TECHNICAL SERVICE, Inc.

ELECTROPLATING AND CHEMICAL ENGINEERS

- Air Force certification tests
- Salt Spray, thickness and adhesion tests
- Spectrographic analysis
- Solution, Metal and Salt analysis
- Plant Design and Engineering
- Plant layout and construction
- Industrial waste and water supply treatment

NEW YORK LABORATORY

CHICAGO LABORATORY

59 East 4 St., New York 3
ALgonquin 4-7940
509 S. Wabash Ave.,
Chicago 5
Harrison 7-7648

WILLIAM E. DECKER

CONSULTING CHEMIST

P.O. Box 383 Plainfield, N. J.
Tel. PL 6-0257
Specialist in Pearlescent Pigments

SCIENTIFIC CONTROL LABORATORIES

Finishing Consultants—Registered Engineers
Salt Spray—Thickness Testing—Analyses
PLANNING—RESEARCH—DEVELOPMENT
Cliffside 4-2406

3136 S. Kolin Avenue, Chicago 23, Ill.

HENRY LEVINE & SON, Inc.

Metal Finishing Consultants

Analysis of all electroplating solutions
Engineering of finishing installations
Air Force Certification Tests
Salt Spray Thickness and Adhesion Tests
153 East 26th St., New York, N. Y.
Murray Hill 5-9427

G. B. HOCABOOM JR. & CO.

Consulting Chemical Engineers

Metal Finishing — Electrodeposition — Solution analyses. AIR FORCE CERTIFICATION TESTS — Salt spray, thickness of deposits, adhesion.

44 East Kinney St. Newark 2, N. J.
Market 3-0055

CROBAUGH LABORATORIES

TESTING - RESEARCH - ENGINEERING

Chemical - Metallurgical - X-Ray
Spectrographic - Organic
Metal Finishing Problems
Air Force Certification Tests

THE FRANK L. CROBAUGH CO.

3800 Perkins Cleveland 14, Ohio

GRAHAM, SAVAGE & ASSOCIATES, INC.

CONSULTING - ENGINEERING RESEARCH

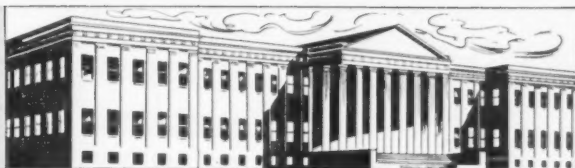
Electroplating and Metal Processing
Waste Treatment and Production Problems

SURVEYS - DESIGNS - SPECIFICATIONS

475 York Rd. Jenkintown, Pa.
1724 Clinton St. Kalamazoo, Mich.

Patents

RECENTLY GRANTED PATENTS IN THE METAL FINISHING FIELD



Protective Coating

U. S. Patent 2,809,901, Oct. 15, 1957.
O. B. Bach.

A process for forming a protective coating on metal which comprises cleaning and roughening the surface of said metal, coating the clean, roughened surface with an organic material selected from the group consisting of drying oils, semi-drying oils, and drying oil acids, heating said coated metal to a temperature between about 350° F. and about 680° F. to convert said organic material to a pyrogenic polymer, and then heating said polymer-coated metal to a temperature in excess of 680° F. to carbonize only the outer layer of said polymer.

Organic Coating

U. S. Patent 2,809,950, Oct. 15, 1957.
G. H. Bowers III, assignor to E. I. du Pont de Nemours and Co.

A process for producing a chlorosulfonated polyethylene coating at a temperature within the range of 5° to 40° C., which process comprises applying, over a surface to form a coating, an aqueous alkaline dispersion of a chlorosulfonated polyethylene containing a dispersed polyvalent metal compound curing agent selected from the group consisting of polyvalent metal oxides, polyvalent metal hydroxides and polyvalent metal salts of weak acids, said salts having an ionization constant of less than 1×10^{-3} and a dispersed opacifying pigment.

Spray Painting Machines

U. S. Patent 2,810,364, Oct. 22, 1957.
H. E. MacArthur and E. L. Faber, assignors to Conforming Matrix Corp.

In a machine for spray painting designs upon articles through accurately fitting masks, in combination, a cabinet having a window therein, a mask holder overlying said window, said mask holder having an opening therein which registers with said window, means for mounting a selected mask upon said mask holder over said opening, said mask holder being yieldable when an article upon which a design is to be painted is pressed against such

mask so mounted over said opening, an air blast sprayer so located within said cabinet as to direct a spray through such mask, and means that are actuated by the yielding of said mask holder for starting the air blast of said sprayer immediately after such yielding and that are actuated by the recovery of said mask for stopping the air blast of said sprayer immediately after such recovery.

Hardening Organic Coatings

U. S. Patent 2,810,662, Oct. 22, 1957.
H. L. Barnebey, assignor to The Meyer-Cord Co.

In the sulfur dichloride vapor treatment of a coating composition containing a compound hardenable by the action of sulfur dichloride, the improvement which comprises supplying sulfur dichloride vapor to a treating zone, passing a coated article through said treating zone and therein subjecting the coating composition to the hardening action of the sulfur dichloride vapor, maintaining guard zones of reduced pressure at the inlet and outlet ends of said treating zone to prevent the escape of sulfur dichloride vapor from the treating zone into the atmosphere, pretreating atmospheric air to reduce the moisture content or relative humidity thereof, and supplying the pretreated air to said guard zones whereby to minimize hydrolysis of sulfur dichloride by contact with atmospheric moisture.

Pickling Waste Treatment

U. S. Patent 2,810,686, Oct. 22, 1957.
G. W. Bodamer and C. Horner, assignors to Rohm & Haas Co.

An electrolytic process for the regeneration of spent iron pickle liquor of commerce containing dissolved ferrous sulfate and sulfuric acid which comprises passing a direct electric current through an electrolysis cell which is divided by means of an anionic permselective diaphragm into an anode compartment and a cathode compartment; said anode compartment containing an anode and an aqueous anolyte comprising sulfuric acid, and said cathode com-

partment containing a cathode and spent iron pickle liquor as the catholyte; and continuing the passage of said current after the pH of the catholyte has reached about 1.8, whereby metallic iron is deposited on said cathode and sulfuric acid is formed in said anode compartment.

Plating Equipment

U. S. Patent 2,810,691, Oct. 22, 1957.
M. Vrillakas and J. Vrillakas.

An electroplating current conductor comprising a tank for containing an electroplating bath at a predetermined level open to the atmosphere, a rotatable shaft in said tank below said level of said bath for supporting a rotatable conducting object to be electroplated, a stationary housing insulated from said tank and disposed in said tank below said level of said bath and subject to the hydrostatic pressure of said bath, a conducting disc in said housing and secured to said shaft, a pool of conducting liquid in said housing in contact with said disc, means for conducting electroplating current to said housing, means for supporting a liquid column open to the atmosphere and open to the interior of said housing for imposing a hydrostatic pressure on said conducting liquid superior to the hydrostatic pressure of said bath, and a seal for inhibiting leakage between said housing and said shaft.

Paint Roller and Mounting

U. S. Patent 2,810,924, Oct. 29, 1957.
E. Slingluff, assignor to The Sunlite Mfg. Co.

An appliance for painting and like operations comprising a shaft and a paint applying roller formed from compressible, resilient material having pores.

Abrasive Blasting Apparatus

U. S. Patent 2,810,991, Oct. 29, 1957.
W. H. Mead and A. A. Zambruno, assignors to William H. Mead.

An apparatus for abrasive-blasting comprising, in combination, a low pressure chamber, an intermediate

chamber, a high pressure chamber, means for impinging granular material against a surface to be treated and a valve control means for facilitating the transfer of granular material from the low pressure chamber to the intermediate chamber via a first transfer valve and from the intermediate chamber to the high pressure chamber via a second transfer valve without affecting the pressures in said low and high pressure chambers.

Automatic Coating Spray Unit For Flocking Machines

U. S. Patent 2,811,130. Oct. 29, 1957. W. J. Friderici, assignor to The Standard Products Co.

An apparatus for processing articles along a predetermined path, which may be used for processing articles of any length or spacing without requiring readjustment.

Matting Aluminum

U. S. Patent 2,811,426. Oct. 29, 1957. R. B. Mason, assignor to Aluminum Co. of America.

The method of treating an aluminum surface to produce a uniform matte finish which comprises immersing the aluminum surface in a solution maintained at about 150 to 212° F. and made up essentially of about 0.5 to 4% by weight of sodium fluoride, about 0.025 to 1% of sodium aluminate, and water, until substantial reaction ceases, and then subjecting the aluminum surface to the action of acid to remove the film formed in the aforesaid solution.

Preheating and Dipping Machine

U. S. Patent 2,811,132. Oct. 29, 1957. F. E. Ahlbin.

Apparatus for heating articles and dipping them in liquid compositions comprising, in combination, conveyor means to carry the articles along a path and article support means on said conveyor.

Electric Spray-Gun

U. S. Patent 2,811,391. Oct. 29, 1957. T. Krebs.

In a spray gun operating without the use of compressed air, a casing, an electromagnet supported by the casing, a source of liquid to be sprayed, a piston pump directly communicating with the liquid to be sprayed, a thrust bolt operatively associated with the piston pump, and an armature adapted to be oscillated by the electromagnet.

Protective Film For Ferrous Metals

U. S. Patent 2,811,456. Oct. 29, 1957. Coleman and F. A. Goff, assignors to Victor Chemical Works.

A composition suitable for use in producing a watersoluble, substantially clear, uniform, nonhygroscopic, nontacky, noncrystalline rust prevention coating on ferrous metal objects consisting essentially of: 13-14% by weight of monoammonium phosphate; 0.8-1.5% of a member of the group consisting of carboxymethyl cellulose, natural gums, starch, polyvinyl alcohol, and alginates which serve to control the viscosity and film-forming properties of the composition; 74-69.5% by weight water; and dialkyl alkali metal sulfosuccinate in an amount not greater than 1% by weight.

Process of Chromizing

U. S. Patent 2,811,466. Oct. 29, 1957. G. A. Samuel, assignor to Metal Diffusions, Inc.

Material for use in chromizing ferrous metal articles, comprising a heat mixture essentially composed of between 35 and 90 parts by weight of powder selected from the group consisting of ferro-chromium, between 10 and 65 parts by weight of inert refractory powder, and between 1/100 and 1/4 part by weight of ammonium bifluoride.

Polytrifluorochloroethylene-Coated Aluminum

U. S. Patent 2,811,471. Oct. 29, 1957. H. N. Homeyer, Jr., assignor to The Connecticut Hard Rubber Co.

The method which includes the steps of treating an aluminum surface with an aqueous solution containing sulfuric and chromic acids, applying a mixture of high molecular weight solid polytrifluorochloroethylene and a significant amount of waxy polytrifluorochloroethylene plasticizer, heating and quenching, thereby forming a securely adhered film of polytrifluorochloroethylene on the aluminum.

Plating on Magnesium

U. S. Patent 2,811,484. Oct. 29, 1957. H. K. De Long, assignor to The Dow Chemical Co.

The method of zinc-plating an article composed of at least 85 per cent magnesium which comprises making the article to be plated the cathode in an

aqueous electroplating solution having a pH between 10.2 and 10.8 at a temperature between 70° and 190° F., said solution containing per liter a pyrophosphate of an alkali of which the pyrophosphate fraction comprises from 40 to 310 grams, a zinc salt of which the zinc fraction comprises from 4.3 to 19.35 grams, a fluoride of an alkali of which the fluoride fraction comprises from 2.5 to 6.5 grams, and a sulfate of an alkali of which the sulfate fraction comprises from 2 to 47 grams.

Paint Brush Wiper

U. S. Patent 2,812,103. Nov. 5, 1957. W. S. Walker and G. I. Mims.

A paint brush wiper comprising: a clamp adapted to be mounted on the top portion of a paint can and including a pair of opposed, spring-actuated jaws for the reception of the can therebetween, said jaws having aligned openings therein, a wiping rod having one end portion slidably engaged in the openings for adjustably mounting said rod on said clamp, and means for anchoring the other end of the rod to the can.

Spray Nozzle

U. S. Patent 2,812,213. Nov. 5, 1957. J. A. Bede.

In a spray nozzle, the combination of at least two tubular members; and a nozzle body in which said members are supported in converging relation to effect collision of streams of liquid flowing through said members; said members being formed with abutting and diverging end faces, the latter intersecting the converging passages of said members to define a discharge slot from which the colliding streams of liquid are sprayed in a pattern of width as determined by the angle between such diverging faces.

Dip Coating Machine

U. S. Patent 2,812,269. Nov. 5, 1957. E. M. Ransburg, assignor to Ransburg Electro-Coating Corp.

A method of coating an article with solvent-containing liquid coating material, comprising passing the article through a heated zone to preheat the article to a temperature above the condensation point of vaporized solvent from the material, dipping it while still so heated into a pool of the heated, solvent-containing liquid coating material, the pre-heating of the article being sufficient to prevent any appreciable condensation of solvent vapors thereon

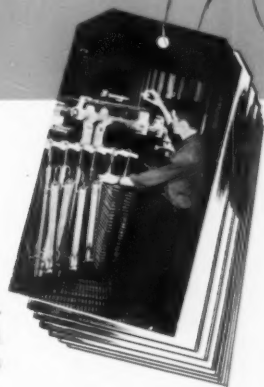
From
H-VW-M

10

important ways to keep metal finishing costs down

All the processes, supplies and equipment in H-VW-M's line have been designed for maximum efficiency and cost savings. But among this full line are a group of products and processes which—if they apply to your operations—can offer outstanding costs and labor saving advantages. Included in this group are high-efficiency electrical and processing equipment, unusual processes, and finishing supplies having unique advantages.

The scope of the exceptional H-VW-M products, described on the following pages, covers a wide range of plating and finishing operations of every type, and the likelihood is strong that several, or perhaps all, are applicable to your plating plant. By investigating all of them, you should strike just the process, equipment or supplies you need to effect very real economies in your operations.



HANSON-VAN WINKLE-MUNNING COMPANY **MATAWAN, NEW JERSEY**

Manufacturers of a complete line of electroplating and polishing processes, equipment and supplies

PLANTS: Matawan, N. J. • Grand Rapids, Michigan • Los Angeles, California (Alert Supply Co.)

Sales Offices: Anderson (Ind.) • Baltimore • Beloit (Wisc.) • Chicago • Cleveland • Dayton
Detroit • Grand Rapids • Los Angeles (Alert Supply Co.) • Louisville • Matawan • Milwaukee
New York • Philadelphia • Pittsburgh • Plainfield (N. J.) • Rochester • St. Louis • San Francisco
(Alert Supply Co.) • Stratford • Toledo • Utica • Wallingford (Conn.) • West Springfield (Mass.)

ELECTRICAL AND PROCESSING EQUIPMENT

GERMANIUM RECTIFIERS

H-VW-M Germanium Rectifiers, known for efficiency, operating economy, compactness and close voltage control, are available in 6 to 150 volt capacity, with current outputs from 500 to 10,000 amperes. Designed for 24-hour-a-day operation at full capacity, with outputs of 12 volts or more, they have efficiencies up to 92%. Exceptional efficiencies are attained at $\frac{1}{4}$ and $\frac{1}{2}$ loads. Voltage regulation as low as 5% can be obtained from no load to full load on some models at voltage ratings of 20 volts and above. Available with various types of voltage controls, manual or automatic, in self-contained or remote-controlled models.

Also look into the revolutionary new low cost line of Powertron Germanium Rectifiers—an H-VW-M first—with exclusive new features. These include: no-fuse DC protection system, no paralleling of junctions, high efficiency and improved regulation of germanium, 44 control positions with range of 2 to 12 volts, and less than 5% ripple. Available in ratings of 750 amperes, 1500 amperes, and 3000 amperes. Something special in packaged units and you get all the advantages at a new low price. If one of these fits your plating requirements, then you've got a real bargain. Immediate delivery. Write for catalog.

RECTIFIER CONTROLS

H-VW-M offers a complete line of rectifier controls to provide for many control functions. Used with either selenium or germanium rectifiers, these controls, properly applied, permit the most efficient control possible. Such devices as manual and motor operated tap switch controls, continuously variable auto-transformers and

saturable core reactors are used with or without supplemental controls to provide automatic voltage stabilization, automatic current stabilization as well as automatic programming. H-VW-M Bulletins ER-108 and ER-109 further explain economical H-VW-M Rectifiers and Controls. Write for it.

FULL AUTOMATIC CONVEYORS

For well over 30 years H-VW-M design engineers have worked continuously for improvements in the automatic conveyors for electroplating and allied operations in which H-VW-M pioneered. Today's full-automatic conveyors are a far cry from the conveyors produced by H-VW-M as early as 1922. But one thing remains the same—and that is H-VW-M's

desire to provide the most advanced and efficient equipment possible. Scores of innovations and improvements resulting from continuing H-VW-M research mean today's H-VW-M Full Automatic Conveyors offer the ultimate in service and efficiency for peak production of the highest quality at lowest cost.

DIAL-A-CYCLE CONTROL

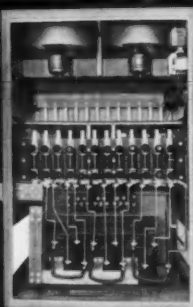
Exemplifying the many H-VW-M developments contributing better, easier plating, is the remarkable new DIAL-A-CYCLE Control. This unique selective by-pass mechanism—of particular interest to aluminum anodizers—permits a whole series of different operations and cycles in one

full automatic conveyor. Length of any treatment time can be varied, and, in anodizing, different colors can be anodized in one continuous operation, and in any sequence. It is a truly revolutionary device, resulting in remarkable labor savings and increased production.

AUTOMATIC LOAD-UNLOAD

Automatic Load and Unload is another recent development of H-VW-M that contributes to greater economies in the plating room. This new transfer unit, operating the same indexing sequence between plating conveyor and a monorail conveyor loads and unloads racks automatically. Manual handling is eliminated by this major advance towards automation in metal finishing.

This, of course, is just one of many types of conveying equipment offered to metal finishers. Return type conveyors, elevator conveyors, high-lift conveyors, straight line conveyors, and others—of every description are H-VW-M designed, manufactured and installed. If you'd like to know more about the cost-saving story of H-VW-M Full Automatic Conveyors, write for Bulletin FA-105.



New Germanium Rectifier with panel removed to show simplified construction.



Manual Tap Switch Control



Motor Operated Tap Switch Control

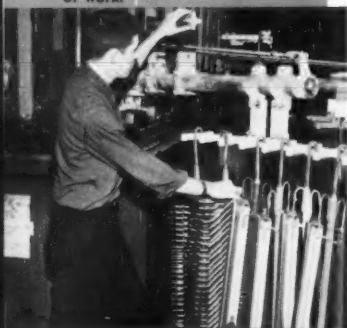


Continuously Variable Auto-Transformer

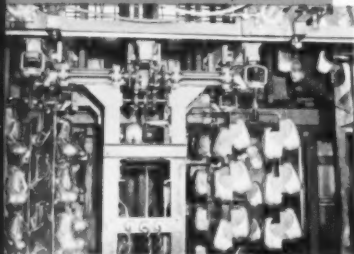


Saturable Core Reactor

Operator is shown adjusting the Dial-A-Cycle mechanism that will determine the cycle for this rack of work.



Automatic loader-unloader has just removed two racks of plated bumper guards and loaded two more of work to be plated.



BUFFING AND CLEANING SUPPLIES

BUFFS

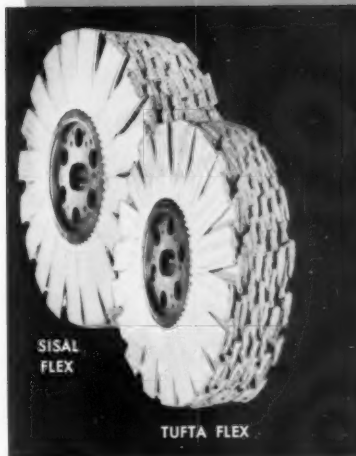
Tufta-Flex and Sisal-Flex Buffs

Speed and economy are embodied in two new H-VW-M Buffs for thorough cutting and coloring on contoured surfaces. For medium and heavy duty, SISAL-FLEX Buffs with sisal-cored tufts are available, and for light to medium duty, TUFTA-FLEX Buffs, having full cloth tufts, are offered.

Both buffs feature double-folded tufts for maximum cutting surface, and to retain compound on the leading edges and ends

of the tufts. To prevent streaking, tufts are staggered in a double row around the buff. Cool running, a feature of both buffs, is the result of staggered tufts, plus a pattern of ventilating holes in the rugged steel center. Fraying, which is wasteful and expensive, is ruled out by the bias-cut construction of both cloth and sisal.

These time and cost-saving new buffs are available in standard diameters from 12 to 18 inches.



Plain Ruff-L-Buff (below) after wearing off 1 inch in test. Loose threads, numerous holes and breaks due to excessive heat and abrasion are apparent.



Binderized Ruff-L-Buff (below) after same test. Notice absence of thread or cloth breakage, convincing proof of Binderizing's effect on buff life.



BINDERIZED® RUFF-L-BUFFS

"BINDERIZED" Ruff-L-Buffs are pre-treated with a high quality compound binder. Because every fibre is impregnated with the same binder used in buffing compounds, Binderized Ruff-L-Buffs are ready for operation at top efficiency from the very first piece.

The cost-saving advantages of Binderized Ruff-L-Buffs are many. "Heading-up" is eliminated, thus break-in time is radically reduced. Because of the natural affinity between the Binderized Ruff-L-Buffs and the

compound, the compound lasts far longer, and is easier to apply. Naturally, much better cut is obtained because of the high amount of compound carried.

Perhaps the greatest advantage of Binderized Ruff-L-Buffs is their internal lubrication which prevents wear inside the buff (see photos). Wear is even—and up to 30% longer. To learn more about the unusual economies of Binderized Ruff-L-Buffs, write for Bulletin No. B-103.

LIQUIMATIC COMPOUNDS

and application equipment

Buffs "live" up to 200% longer . . . No compound waste . . . Reduced labor costs . . . Fast cutting, easy cleaning—all these advantages and more are embodied in the unusual Liquimatic Liquid Compounds and application equipment.

Because of the enormous economies of using the Liquimatic System, the system soon pays for itself in buff, compound and labor savings.

A complete line of Liquimatic Compounds is available for cutting and coloring ferrous and non-ferrous metals. These provide an adhesive, slow-wearing buff face, and have a high safety factor because of their high flash point. All are of sprayable viscosity, and have a long storage life. Write for H-VW-M Bulletin No. Co-103, which fully describes Liquimatic and other economical H-VW-M Compounds.

85-S ALUMINUM CLEANER

H-VW-M devotes constant research to the subject of cleaners and the result is a comprehensive line of Matawan Cleaners giving superior results in soak cleaning, power spray operations, oxide removal, and special cleaning and etching operations.

Of particular importance is H-VW-M's new 85-S Aluminum Cleaner, which offers interesting advantages to aluminum finishers.

It prevents scale formation, for instance, thus keeping coil and tank walls scale free, and it leaves an extremely bright surface. Its built-in regenerator makes maximum effective use of caustic in the bath.

H-VW-M Bulletin C-108 tells about this unusual cleaner, and other Matawan Cleaners offering unusual money-saving advantages.

as it approaches said pool of coating material, then passing it through a cooled zone for promoting removal of

SYNTRON

a-c to d-c



TWO OUTSTANDING H-VW-M PROCESSES THAT ARE UNUSUALLY ECONOMICAL TO USE

LEVELUME

H-VW-M's new LEVELUME represents a milestone in nickel plating processes. It is the first bright nickel process to combine qualities of full brightness, high leveling and exceptional speed. In high-production installations, deposition rates with LEVELUME are 100% higher than those obtained with any other process, but will require some air agitation equipment.

Conversion to Levelume is simple, involving no new investment in conveyors, or tanks. Key to the new process are its addition agents. With them an activated carbon pack can be used in the plating solution filter. This constantly removes harmful organic contaminants, preserving the purity of the bath, and consequently contributing to the economy of the process.

A few of the additional benefits include high surface activity, good ductility, controlled stress, and the feasibility of double coatings. A full description of the process—one in the family of NICKEL-UME processes—is available in the Levelume Manual, which is available on request.

CADALUME

H-VW-M's New Cadalume Process has all of the extras that you have been looking for in cadmium plating. It is the newest and best answer because it does the job faster and better. The new improved Cadalume Process of H-VW-M lets you get at least 80,000 ampere hours for every gallon of brightener consumed. And bright dipping is eliminated for most applications! The secret? It's simply this: You use two different Cadalume Brighteners. One is the Cadalume Make-Up Brightener and you use it only when you make up a new bath or convert an existing one. The other—Cadalume Brightener—is the strong addition agent used for all maintenance.

Here's why Cadalume keeps your costs low: The bright range is increased up to 10% . . . you get very high plating speeds—up to 10% increase . . . 4 times longer bath life . . . better distribution . . . and the brightener is more stable—it won't plate out. This simple, easy-to-operate economy is something for you to see. Ask for the New Cadalume Technical Manual.



**H-VW-M PROCESSES, SUPPLIES AND EQUIPMENT
KEEP PLATING ROOM COSTS DOWN . . .**

They're Always Your Best Buy!



HANSON-VAN WINKLE-MUNNING COMPANY MATAWAN, NEW JERSEY

Manufacturers of a complete line of electroplating and polishing processes, equipment and supplies
PLANTS: Matawan, N. J. • Grand Rapids, Michigan • Los Angeles, California (Alert Supply Co.)

Sales Offices: Anderson (Ind.) • Baltimore • Beloit (Wisc.) • Chicago • Cleveland • Dayton
Detroit • Grand Rapids • Los Angeles (Alert Supply Co.) • Louisville • Matawan • Milwaukee
New York • Philadelphia • Pittsburgh • Plainfield (N. J.) • Rochester • St. Louis • San Francisco
(Alert Supply Co.) • Stratford • Toledo • Utica • Wallingford (Conn.) • West Springfield (Mass.)

Printed in U. S. A.

as it approaches said pool of coating material, then passing it through a cooled zone for promoting removal of solvent from the liquid coating material on the article, and then repassing the coated article through said heated zone.

Gas Plating

*U. S. Patent 2,812,270. Nov. 5, 1957.
P. Alexander, assignor to Continental Can Co., Inc.*

A process for depositing a coating of metal from the vapor of said metal on a surface of a metal base, said surface having been treated to remove adsorbed gases and oxidation products therefrom, and for bonding said coating to said base which comprises heating said metal base, and then exposing the heated metal base to the vapor of the metal for coating in a vacuum, said metal base during at least a portion of such exposure being at a temperature sufficiently high that said coating and said base will appreciably inter-diffuse.

Gas Plating

*U. S. Patent 2,812,272. Nov. 5, 1957.
H. R. Nack, H. J. Homer and J. R. Whitacre, assignors to The Commonwealth Engineering Co. of Ohio.*

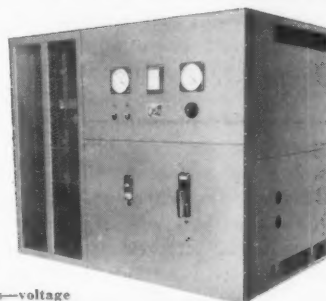
An apparatus for gas plating heat insulating material in continuous lengths.

Electroforming

*U. S. Patent 2,812,294. Nov. 5, 1957.
G. Rosenqvist.*

The method of making hollow metal articles by electrodeposition which includes working the deposited metal successively in different ways during the electrodeposition process comprising, first, working the cathode surface by moving metal particles from one position to another entirely within the cathode surface by pressing on electrodeposited surface particles of the cathode with a tool only in directions substantially normal to the surface of working contact so as to avoid lateral displacement of surface particles to loosely superimposed positions outside of said cathode surface, second, working the cathode surface in selected areas by moving metal particles from one position to another loosely superimposed position outside of said cathode surface, and, third, working metal electrodeposited over said selected areas by repeating said first described working process.

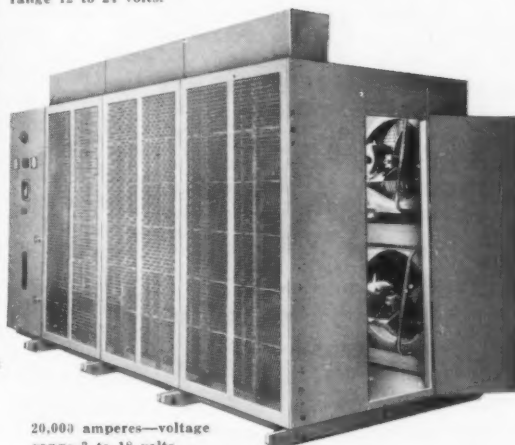
SYNTRON a-c to d-c SELENIUM RECTIFIER UNITS



10,000 amperes—voltage range 12 to 24 volts.



Showing interior arrangement of rectifier stacks and bus work



20,000 amperes—voltage range 3 to 18 volts.

provide more efficient, more economical and more dependable DC power supplies

... designed to meet the rigid power requirements of the Metal Finishing Industry. They are low-voltage, high-amperage units for electro cleaning, plating, polishing and electro chemical purposes.

SYNTRON Selenium Rectifier Units are highly efficient, sturdy constructed units, using SYNTRON'S own Selenium Rectifier Stacks to assure dependability, long life and low maintenance.

Built as a single, compact, space-saving unit, rated for continuous operation. Either fan, convection cooled or oil immersed units. Easy to install — easy to maintain.

Solve your a-c to d-c power conversion problems efficiently and economically with SYNTRON Selenium Rectifier Units. MF158

Other SYNTRON Equipment

- Battery Chargers • Electric Heating Elements • Sinuated Wire
 - Electric Heating Panels • Selenium Rectifier
- For complete information write for catalog—FREE

SYNTRON COMPANY

723 Lexington Avenue

Homer City, Penna.

Coloring Anodized Aluminum

U. S. Patent 2,812,295. Nov. 5, 1957.
J. D. Patrick, assignor to General Motors Corp.

In a method for making multi-colored designs upon a sheet of anodizable metal, said design having sharply defined boundaries between adjacent color areas, the steps comprising: forming a pattern having sharply defined raised portions and depressed portions in the surface of a sheet of anodizable metal, cleaning said surface, anodizing said metal surface, dyeing the anodized surfaces in a solution of soluble organic dye, applying a relatively viscous substance over said raised portions which is impregnable to water, said substance being of sufficient viscosity so that on application to said raised portions it will not flow beyond the sharply defined edges thereof, immersing said anodized surfaces in a solution of soluble darker and different organic dye than the first said dye, and removing said coating substance and sealing said dyes within the pores of said anodized surfaces.

Conversion Coating

U. S. Patent 2,812,296. Nov. 5, 1957.
R. A. Neish, assignor to U. S. Steel Corp.

In a method of coating sheet steel, the steps including passing it through a solution consisting essentially of from 1 to 6% of a water-soluble chromate in which the chromium is hexavalent, water and a compound containing the orthophosphate radical, the amount of said compound being such as to provide an orthophosphate-ion concentration in the solution of from 1.0 to 3.4%, said solution having a pH value of from 1 to 2, subjecting the steel to electrolysis as cathode while in the solution, at a current density of from 15 to 90 amps./ft.², then removing the steel from the solution and at least partially drying the liquid film adhering thereto.

Chromium Plating

U. S. Patent 2,812,297. Nov. 5, 1957.
J. E. Stareck and R. Dow, assignors to Metal & Thermit Corp.

Method of preventing etching of a metal article to be plated in a chromic acid plating bath containing acid radicals, said bath tending to etch non-plated, exposed areas of the article, which comprises immersing at least that portion of the article to be pro-

tected against etching in an aqueous solution consisting essentially of 100 to 1000 g.l. of CrO₃ for a period of time ranging from 0.5 to 10 minutes and at a temperature ranging from 50 to 110° F., passing current in the range of 0.05 to 2 amperes per square inch from an anode to said article as a cathode during said time, thereby forming an etch-resistant film on the article, said filming step being inoperative to deposit chromium plate on the article, then placing the article in said chromic acid chromium plating bath and plating chromium thereon.

Protective Coating

U. S. Patent 2,812,298. Nov. 5, 1957.
R. H. Hardoen, assignor to Hohman Plating & Mfg., Inc.

The method of electroplating a protective coating upon ferrous parts including the steps of electroplating a flash coating of zinc on the part followed by electroplating upon the part functioning as cathode, a protective coating from a solution consisting essentially of 13 ounces of manganese sulphate, 10 ounces of ammonium sulphate, 8 ounces of ammonium sulphocyanate, and 5 ounces of ammonium molybdate, the above compounds being dissolved in water, the amounts being in ozs./gal., the current density being in the range of 5 to 17 amperes per square foot.

Gold Plating

U. S. Patent 2,812,299. Nov. 5, 1957.
F. Volk, assignor to Birle & Co.

In a method of electrolytically depositing a metal selected from the group consisting of gold and gold alloys, the step of subjecting an aqueous solution containing an alkali metal-gold-cyanide complex to electrolysis in the presence of at least one buffer in an amount sufficient to maintain a pH of between 6.5 and 7.5 during electrolytic deposition of said metal from said solution.

Vacuum Plating

U. S. Patent 2,812,411. Nov. 5, 1957.
L. Moles, assignor to Hughes Aircraft Co.

In an apparatus for the vapor deposition of molten metal in substantial thickness upon a surface wherein the molten metal is evaporated from a resistance heating filament by the application of electric current to the filament upon which has been placed the metal

to be evaporated, the resistance heating filament comprising: a continuous length of wire, said wire having a substantially constant cross sectional area, and physical barriers of heat conductive material spaced at intervals along the length of said filament and in surrounding relationship therewith, said physical barriers having a melting temperature substantially greater than the vaporizing temperature of said molten metal and a greater cross-sectional area than that of said wire.

Roller Coating Machine

U. S. Patent 2,812,739. Nov. 12, 1957.
F. J. Fleischauer, assignor to H. H. Robertson Co.

A roller coating machine for coating elongated sheets having a plurality of longitudinal corrugations, in which the roller is mounted to rotate in engagement with the corrugations as the sheet is advanced and capable of deforming under the pressure of the coating operation so as to conform closely to differences between the normal shape of the roller and the size of the corrugations; and a similarly constructed doctor roller cooperating with said coating roller and forming therewith a trough for holding a supply of the coating material.

Apparatus for Coating Wire

U. S. Patent 2,812,741. Nov. 12, 1957.
J. A. O'Connor, assignor to Essex Wire Corp.

A device for applying coating material to vertically moving wire strands consisting of a plurality of coating material inlet tubes in spaced vertical relation, applicator fingers mounted on said tubes, said applicator fingers further characterized by a coating chamber in communication with said coating inlet tube and inlet and outlet openings to permit the ingress and egress of a wire strand from said chamber, and means to rotate said fingers on said tubes to permit the withdrawal of said finger from coating engagement with a wire strand.

Paint Can Channel Cover and Brush Support

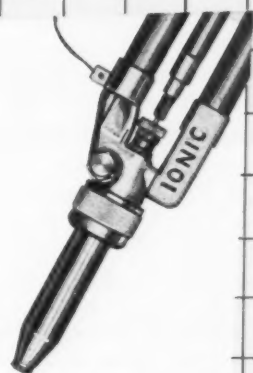
U. S. Patent 2,812,886. Nov. 12, 1957.
A. S. Weinstein.

In combination with a paint can or the like having an inwardly extending rim with a continuous channel formed in the rim and defined by inner and

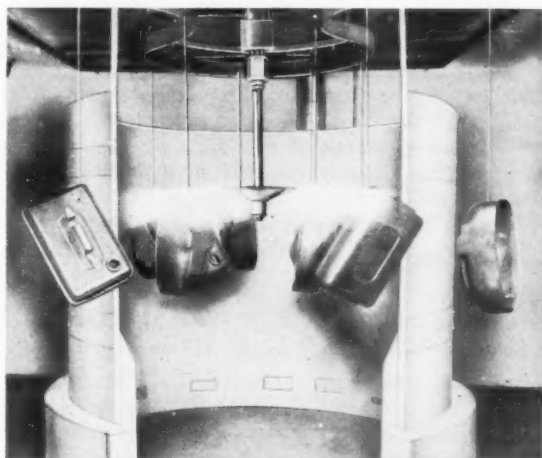
Invitation
to improve production

You are cordially invited to bring your products
for a **FREE** demonstration of Ionic
Electrostatic Spray Equipment.

R.S.V.P.



*Patented



IONIC CENTRIFUGAL ATOMIZER

**SOLVE YOUR FINISHING
PROBLEMS WITH AN
IONIC ELECTROSTATIC
SPRAY SYSTEM**

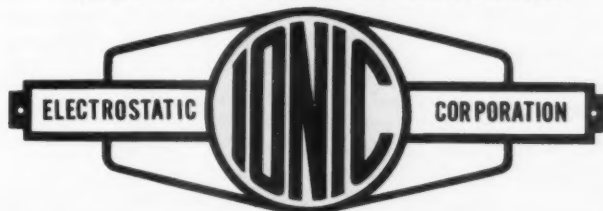
Features:

- ★ NO RENTALS
- ★ NO ROYALTIES
- ★ SPEEDS UP PRODUCTION
- ★ INCREASES PAINT MILEAGE

PROOF BY TRIAL IS OUR MOTTO

Before installing any automatic spray equipment, we urge you to investigate the many advantages of Ionic Electrostatic Spray Equipment. Our laboratory at Garfield, New Jersey, is at your disposal. Why not arrange for a **FREE** demonstration today? Ship your samples and coating materials to us with all pertinent information. We will then conduct tests and issue a detailed laboratory report with our recommendations.

WRITE TODAY FOR FREE LITERATURE.



111 MONROE STREET, GARFIELD, N. J.

outer walls; a pouring cover comprising an extruded flexible strip made of rubber-like material, a central rib formed in the lower surface and extending lengthwise of the strip, said rib fitting into the channel between the walls of the rim, inner and outer ribs formed in the lower surface of the strip.

Hot Galvanizing

U. S. Patent 2,813,044. Nov. 12, 1957. A. E. Chester, assignor to Poor & Co.

A process of coating a ferrous metal with zinc which comprises precoating the surface of said ferrous metal with a thin coating of a chromium aldionate dispersed in a film-forming oxyalkylated fatty amine which adheres to the ferrous metal and applying a coating of molten zinc to said ferrous metal.

Paint Roller

U. S. Patent 2,813,292. Nov. 19, 1957. Q. W. McLendon.

A manually operated paint applicator of the roller type.

Plastic Spraying Apparatus

U. S. Patent 2,813,751. Nov. 19, 1957. F. E. Barrett, assignor to Sealzit Co. of America

Apparatus for coating an object with a plastic of the polyester resin type, comprising: a first container for a solution of polyester resin and a catalyst therefor; a second container for a solution of polyester resin and an accelerator therefor; a source of compressed air; means connecting said source with said containers; a spray gun having a main body; a pair of parallel spaced-apart nozzles disposed at the front of said body, each of said nozzles including a hollow forwardly and inwardly tapering air tip element, and a frusto-conical fluid tip element positioned within said air tip element; a spray aperture formed in the front portion of each of said air tip elements with the axes of said apertures being inclined towards one another; an orifice formed in the front end of each of said fluid tip elements; and, parallel needle valve means carried by said body for controlling the flow of said solutions through said orifices.

Immersion Lead Bath

U. S. Patent 2,813,804. Nov. 19, 1957. F. E. Kendall and P. Golar, assignor to Steel Ceilings, Inc.

The method of forming a protective substantial sound, adherent lead coating on ferrous articles which comprises

subjecting such article to the action of a water solution of a lead salt of an aliphatic mono-basic hydroxy acid having a pH below 7 and a lead ion concentration of from about 50 to 250 grams per liter at a temperature of from about 50 to 250 grams per liter at a temperature of from 155° to 200° F. for a period of time sufficient to deposit a lead coating of at least 0.0003 inch thickness on such article by chemical displacement.

Immersion Lead Bath

U. S. Patent 2,813,805. Nov. 19, 1957. F. E. Kendall and H. A. Wagner, assignors to Steel Ceilings, Inc.

The method of forming a lead coating on a ferrous article which comprises applying thereto a water solution of a lead salt of an aliphatic poly-basic hydroxy acid having a pH of from about 4.5 to about 6.5, a lead ion concentration of from about 3 to about 50 grams per liter, and an operating temperature of from about 130° F. to boiling for a time sufficient to deposit an appreciable lead coating on such article by a chemical displacement reaction.

Conversion Coating

U. S. Patent 2,813,812. Nov. 19, 1957. R. I. Somers and J. Rotsko, assignors to Parker Rust Proof Co.

An aqueous solution for coating iron or zinc surfaces, said solution comprising as the essential coating-producing ingredients about .5% to 2.5% phosphate ion, an ion of the group consisting of the zinc ion and the manganese ion in a proportion to form dihydrogen phosphate with said phosphate ion, 0.01% nickel ion, 0.0003% to 0.005% copper ion, and at least one oxidizing ion selected from the group consisting of the nitrate ion and the nitrite ion in a concentration of about 0.2%-1% nitrate ion and 0.002% to 0.008% nitrite ion.

Conversion Coating

U. S. Patent 2,813,813. Nov. 19, 1957. H. Ley, H. A. K. Kopp, W. Rausch and H. Fleischhauer, assignors to Parker Rust Proof Co.

A method for forming a chemical protective coating on metallic surfaces which comprises the steps of heating the metallic surface in an oxidizing atmosphere to a temperature above 400° C. to form an oxide coating thereon, heating the oxide coated surface in a reducing atmosphere to remove the

said oxide coating and form a metallic clean surface, cooling said surface to a temperature in the range of 100° C. to 400° C. in an inert atmosphere, and contacting the said article in heated condition with a phosphate coating solution for a time sufficient to form a phosphate coating on said surface.

Conversion Coating

U. S. Patent 2,813,814. Nov. 19, 1957. E. W. Goodspeed and F. G. Pollard, assignors to Parker Rust Proof Co.

The process of producing an adherent, protective coating on a surface of titanium and zirconium metals which comprises contacting a metal surface with an aqueous solution consisting essentially of manganese dihydrogen phosphate, at least about 0.05% by weight of at least one ion selected from the group consisting of titanium ions and zirconium ions, an oxidizing agent in an amount having an effect on the coating-forming ability of said solution equivalent to about 0.5% to about 1.3% of the nitrate ion and the fluoride in an amount in excess of the concentration of the ion selected from the group consisting of titanium and zirconium ions.

Conversion Coating

U. S. Patent 2,813,815. Nov. 19, 1957. D. L. Miles, assignor to American Chemical Paint Co.

In the art of preparing a succession of metal articles for the reception of a siccative finish where the surface of the articles is first provided with a phosphate coating, the method of successively treating the phosphate coated articles initially with a dilute rinsing solution consisting essentially of acid from the class consisting of chromic and phosphoric acids, thereafter treating each article so rinsed only with virgin, uncontaminated rinsing solution as a final rinsing step, collecting the run-off rinsing solution from said final virgin rinsing step and delivering it as replenishment to the initial rinsing solution, and drying the articles after treatment with the final virgin rinsing solution.

Conversion Coating

U. S. Patent 2,813,816. Nov. 19, 1957. G. Otto, assignor to American Chemical Paint Co.

An aqueous, dilute mineral acid metal-coating bath substantially free of halide and consisting essentially of acid from the class consisting of nitric,

phosphoric, sulphuric, sulphamic and sulfurous acids; manganese oxalate; and a sulphur-bearing compound from the class which contains oxygen and will yield sulphur dioxide (SO_2) and sulphur upon decomposition in acid solution; the quantity of manganese oxalate in the bath being between 1 and 18 grams per liter, the quantity of the sulphur compound being such that a 10 ml. sample of the bath will react with at least 4 ml. of 0.5 normal iodine solution, using starch indicator, to a blue endpoint, and the amount of free acidity being such as to yield a pH of from 0.7 to 2.

Dry Film Thickness Gage

U. S. Patent 2,814,122. Nov. 26, 1957.
M. R. Euverard.

In a gage for measuring the thickness of a dry coating upon a base material, the combination comprising a circular toothed disc and a circular side supporting plate for said disc, said disc being mounted eccentrically upon said supporting plate so as to cause different teeth on said disc to project different distances beyond the periphery of said supporting plate.

Spraying Apparatus

U. S. Patent 2,814,530. Nov. 26, 1957.
C. Portillo.

A device for spraying a substance such as paint or the like onto the surface of an object which comprises a sprayer unit including a nozzle, a hollow tubular shaped air shield unit mounted on said nozzle, said shield unit including an air receiving tubular member in contact with the outer surface of the nozzle, two inclined end wall members secured to and flaring outwardly from the tubular member, and a tubular shaped outer member secured to the outer periphery of the end wall members, together with a plurality of angular shaped tubular members mounted on the outer member said tubular members providing means for creating a generally tubular shaped protective cloak of air encompassing the atomized spray material emitted from the nozzle.

Conversion Coating

U. S. Patent 2,814,577. Nov. 26, 1957.
N. J. Newhard, Jr., assignor to American Chemical Paint Co.

In the art of coating a succession of aluminum pieces by subjecting the sur-

face thereof to the action of an aqueous acid coating solution wherein the coating producing ingredients consist essentially of fluoride ions, chromate ions and ions from the class consisting of phosphates and arsenates, the method of replenishing the solution which includes adding thereto compounds containing chromates ions and ions from the class of phosphates and arsenates sufficient to maintain the required concentrations thereof plus fluoride in sufficient quantity to maintain the fluoride activity of the solution substantially constant as measured by determining the weight loss of a standard piece and type of glass when immersed

in the solution for a given period of time at a substantially constant temperature.

Paint Can Attachment

U. S. Patent 2,814,824. Dec. 3, 1957.
A. W. Woodward.

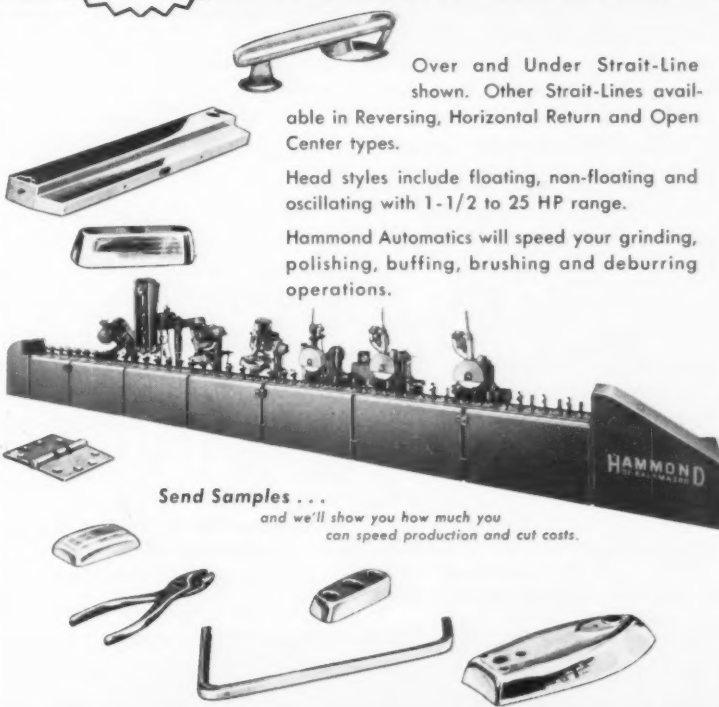
An attachment for a paint can having an inwardly extending rim around the upper edge comprising a pair of spaced opposed plates of a size to fit inside the can and extend substantially vertically into said can on opposite sides of the center thereof, each plate having the top corners notched to provide clearance for the rim of the can.

**GRIND
POLISH
BUFF
DEBURR**

WITH A

Hammond

STRAIT LINE AUTOMATIC



Over and Under Strait-Line shown. Other Strait-Lines available in Reversing, Horizontal Return and Open Center types.

Head styles include floating, non-floating and oscillating with 1-1/2 to 25 HP range.

Hammond Automatics will speed your grinding, polishing, buffing, brushing and deburring operations.

Send Samples . . .
and we'll show you how much you
can speed production and cut costs.

Hammond Machinery Builders

1601 DOUGLAS AVENUE KALAMAZOO, MICHIGAN

77/Circle on Readers' Service Card

ABSTRACTS

Practical Aspects of Barrel Plating

R. Rembarz: *Metallwarenind. und Galvanotechnik*, 48, No. 5, 223.

Oblique barrels of the type commonly called "bull's eye" are so constructed that the anode is brought approximately parallel to the electrolyte surface in the barrel. Its position can only be changed as regards the immersion depth. Tests have shown that the suspension of the anode which permits of bringing it parallel to the plane of the ware in the barrel, is of greater advantage. If observation is made of well settled ware in the running barrel, it will be seen that an angle of rest plane of the ware is formed, which is approximately a 45° to the middle axis and 60° to the horizontal.

It is a fairly simple matter to achieve the conditions mentioned above. For the purpose, there is only needed an additional, sufficiently stable copper or brass rod. This is fastened in place of the usual anode and the anode bar is fastened in the modified position at its lower end.

It is thus possible to install the anode parallel to the surface plane of the ware. To avoid a short circuit, a spacing distance is chosen which is as long as the largest component part which is to be plated.

With this anode positioning, under otherwise equivalent conditions, there is achieved (compared with the old arrangement) about a 50% higher current throughput. Under practical conditions, with this arrangement in a 50 liter barrel plating unit, currents of 100 to 150 amp. were obtained with a 10 volt machine.

Electrical Conductivity of Electroless Nickel Coatings

A. Keil: *Metalloberflaeche*. Vol. 10, No. 12, p. 356.

Nickel coatings produced by the chemical reduction method, contain about 6-7% of phosphorus. This phosphide inclusion causes a lowering of the electrical conductivity of the nickel metal. On the average, this reduction is about 14% on that of the pure nickel.

The lowest measured value of the series of tests described, was 10% and the highest 23%. These findings conform broadly with values which had been found previously with electroplated silver coatings which contained foreign constituents for increasing the hardness of the silver metal.

The results of tests with both acid and alkaline baths are as follows:

The measured values for the specific electrical resistance of 1.5 micron deposits from the acid bath were in the range of $5.5 - 6.5 \times 10^{-5}$ ohm-cm.

The measured values obtained on 2.5 micron deposits from the acid bath were between 5.2 and 6.8×10^{-5} ohm-cm.

A 9 micron thick nickel coating was produced, first started in the acid bath and then built up in the alkaline bath. Resistance values were between 3.0 and 4.0×10^{-5} ohm-cm.

A nickel coating 11 microns in thickness was produced, first started in the acid bath and then built up in the alkaline bath. Resistance values were between 4.5 and 5.5×10^{-5} ohm-cm.

Improvement of Corrosion Resistance of Metals by Chemical Treatments

Revue de l'Aluminium. Vol. 33, p. 986.

A general survey is given from a symposium of authors on the various methods for surface degreasing, for pretreatment before the application of coatings, phosphating, and the protection of aluminum and magnesium, nickel plating including the chemical nickel deposition process; also the installation of large tunnel treatment units for continuous operation.

Defective Appearance of Bright Anodized and Heated Surfaces of Aluminum Alloys

P. Lelong and J. Herenguel: *Revue de l'Aluminium*. Vol. 33, p. 923.

High purity aluminum is used for reflectors on a large scale, after bright anodizing. On being employed for an infra-red drying process, a phenomenon occurred on the anodized surface which has been known for a long time. Cracks are formed in the oxide film, which sometimes even parts from the base surface. The surface finish suffers and the metal easily undergoes further damage.

The reason for this trouble lies in the nature and particularly the variability of the drying inside the anodized oxide film. It is important to use the high purity alloy containing 1% magnesium and the film thickness should be limited to 8-12 microns. The after-treatment should be in an acid ester-emulsion, not with boiling water.

Structure of Nickel-Zinc Plated Alloys

E. Raub and F. Elser: *Metalloberflaeche*. Vol. 11, No. 5, p. 165.

It has been found that zinc reduces the ductility of nickel deposits but does not influence the adhesion. The throwing power of the bath is increased, with the exception of the Watts bath with a pH of 2.2. In spite of the great advantages which zinc can offer under certain conditions in nickel baths, it is generally regarded as a nuisance impurity.

The object of the present research was to ascertain the composition of the alloys deposited under various conditions from zinc-containing baths; also, the influence of the zinc on the deposition potential of the nickel. In addition, the structure of the plated nickel-zinc alloys was determined. Two baths were used for the tests as follows: a bath containing, per liter, 240 g. nickel sulfate, 20 g. potassium chloride and 30 g. boric acid; a chloride bath of the same nickel content containing per liter: 200 g. nickel chloride and 30 g. boric acid.

The potential measurements were conducted at 20° and 50°C. in still and agitated baths. It was found that the potential value becomes more uncertain with the addition of zinc to the nickel bath, as stronger fluctuations occur. With a zinc content of 0.5 and 1.5 g./l. in the bath, it was found that the deposition of zinc is strongly favored, as compared with the nickel. The alloy deposits obtained at 50°C. contained more zinc than those produced at 20°C. Deposits richer in zinc were deposited from the agitated than from the still baths. The zinc content of the deposits fell with increasing current density. The values obtained showed that zinc behaves as a nobler metal whose deposition is strongly influenced by the operating conditions, among which the polarization is the least factor.

The nickel-zinc alloys are deposited

in a bright form, as long as they consist of the nickel-rich, cubic face-centered alpha mixed crystal. Alloys in which the gamma phase occurs in addition to the alpha phase, particularly those in which the gamma phase is dominant, are mat, dark gray to black and deposit partially in a loose form. The alloys which consist of alpha mixed crystals or of alpha mixed crystals with only highly dispersed, small occlusions of the gamma phase, are actually harder and less ductile than pure nickel deposits, but are not actually brittle. Alloys in which the gamma phase occurs, are very brittle and can be easily pulverized. The alloys obtained during the simultaneous deposition of zinc and nickel, are not in the equilibrium condition.

Chromium Plating Piston Rings of Magnesium-Containing Cast Iron

N. A. Solowjew: *Vestn. Masstro* (Moscow). Vol. 35, No. 7, p. 75.

A technique is described, which was started up in a Russian engineering factory, for porous chromium plating and coating with a wear-resistant layer of a soft alloy, for finishing piston rings of magnesium-containing cast iron. The equipment used is described as are the composition of the chromium plating bath and the sequence of the working stages. Indications are given of the technical requirements which the rings must satisfy, the test methods and the possible sources of faults with the plating as well as means for avoiding these defects.

Modern Cadmium Plating Practice

C. Quattrone: *Galvano Technica* (Italy). Vol. 7, No. 12, p. 314.

The ratio between sodium cyanide and cadmium (as metal) is quite important and should amount to $\frac{\text{NaCN}}{\text{Cd}} = 3.75$.

A typical cadmium bath is as follows:

Cadmium oxide	19 - 47 g./l.
Sodium cyanide	60 - 150 "
Gelatine	0.1 - 0.5 "
Nickel sulfate	0.2 - 0.8 "

Another example of bath formulation is:

Cadmium carbonate	25 - 50 g./l.
Sodium cyanide	60 - 112 "
Turkey Red oil	0.5 - 1 "
Nickel sulfate	0.2 - 0.5 "
Sodium hydroxide	12 - 25 "

In the first bath the required NaOH is formed by the chemical reaction of the CdO with the sodium cyanide and does not have to be added. As cadmium carbonate is the basis of the metal addition in the second example, the NaOH is specially added. In addition, the calculation of the ratio Cd:NaCN:NaOH is conducted similarly as with zinc baths and exerts just as important a role.

The following operational data hold for the above-mentioned two ex-

amples:	
Bath temperature:	20 - 40°C.
Cathode current density:	0.5 - 5 amp./sq. dm.
Anode current density:	2 - 1 amp./sq. dm.
Voltage:	1.5 - 4 volts

The cadmium anodes must be of high purity and have considerable influence on the brightness and quality of the cadmium deposit.

As a post-treatment bath, providing a brightening and passivation of the deposit, there is used:

Chromic acid	100 g./l.
Sulfuric acid	2 "

FOR FAST, ECONOMICAL
BUFFING AND POLISHING —



ATLANTIC
GREASELESS COMPOUNDS

NEW PLASTIC CONTAINER —
ELIMINATES COMPOUND WASTE
REDUCES APPLICATION TIME

Here's a new waterproof plastic container for Atlantic Greaseless Compounds that saves time and money on buffing and polishing operations. Now, there is no need for operator to spend time stripping away cover . . . plastic container wears away as stick is applied to spinning buff. And, costly waste is reduced since container exposes only the compound that is in contact with the buff. Standard aluminum tube and foil-lined fibre board container available if desired.

Atlantic Compound combines continuous research, high grade materials and rigid quality control of manufacturing to assure you of a product with extremely high uniformity.

Write for free sample on your letterhead.



THE ATLANTIC COMPOUND CO.

1858 BALDWIN STREET, WATERBURY, CONNECTICUT

78/Circle on Readers' Service Card

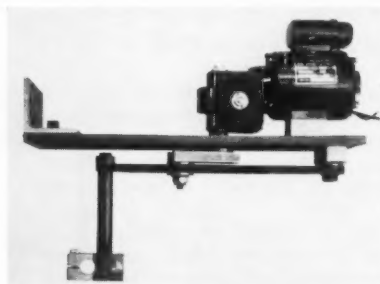
Recent Developments

NEW METHODS, MATERIALS AND EQUIPMENT
FOR THE METAL FINISHING INDUSTRIES



Spray Gun Mover for Liquid Buffing Compound

J. J. Siefen Co., Dept. MF, 5643
Lauderdale, Detroit 9, Mich.



Oscillating gun mover S.O.G.M.-1000 is used on wheels from 8" to 24" in width, in place of a battery of guns or the old type chain drive or rack and pinion gun mover. It can be mounted far enough away from the polishing wheel so that it will not interfere with the necessary adjustments of the wheel. It is said to be easy to install, with practically no maintenance needed.

Operated by a 1/30 HP motor with a thermal overload control, the gun mover will give controlled distribution of the compound to the wheel at all times, with the aid of a timer and solenoid valve. A free demonstration will be given on request.

79/Circle on Readers' Service Card

Clear Protective Coating

Allied Research Products, Dept. MF,
4004 E. Monument St., Baltimore, Md.

Irillac #1000 is a unique new type of clear, protective coating for steel and non-ferrous metals. The product contains extremely effective corrosion inhibitors and can be used to replace or enhance other chemical and electrolytic finishing systems. Using water as a solvent, the material eliminates many of the disadvantages of lacquers, inhibited oils, and waxes. It greatly improves handling and storage characteristics of the surface to which it is applied.

The product is furnished as a concentrated solution of a water-soluble polymer with built-in complex corrosion inhibitors. The stock solution is diluted with water and applied to the surface by simple dip, brush or spray method. It dries to an extremely thin, tough, durable coating which brings full tone to colored surfaces and clarity to iridescent surfaces. Neither the solution nor the coating has any chemical effect on the metal or treated metallic surface, and the coating can be used as the only finish, or to enhance the value of post-treatments.

Application of the new coating involves no hazards, as working solutions contain no organic solvents and are non-fuming, non-toxic, and require no thinners other than water.

80/Circle on Readers' Service Card

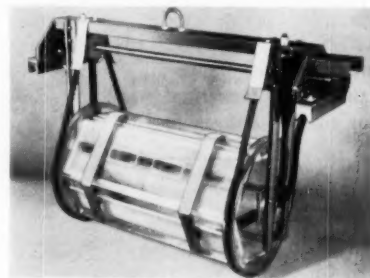
Cogged V-Belt Drive Plating Barrel

G. E. Equipment Co., Dept. MF,
15585 Brookpark Rd., Cleveland, Ohio.

Current models of cogged-v-belt drive plating barrels are claimed to feature major advancements, unique in their field. New, self-lubricating drive-pulley cog-pins of Polydur virtually eliminate belt or pin wear due to friction. Improved, oil-chemical resistant neoprene cogged-v-belt has added stainless steel tensile members, and is covered by double nylon envelope for extra service. Shorter, huskier belt "teeth" add strength, wear-resistance. Redesigned, self-adjusting door clamps (2 on reg. size, 3 on large) have one end spring-looped for positive closures, easier operating. Replacing the single-loop-type handle at one end of door are two, new "T" door handles, for two-handed grip and safer, easier handling. They are welded on center structural rib which reinforces full-length of door for extra strength.

Other exclusive features include floating end plates for constant contact of inverted V-blocks, which can't rock

in saddles and provides better contact. Longer inverted "V" blocks offer 16" more contact area, up to 30% greater current flow per load. Automatic positioning — guide channel directs superstructure into operating position, quicker, easier. Also, "horn-type" version features 3-point suspension with 4-point contacts (no "shorts" from burned-out insulation and arcing). Adjustable bearings support drive shaft, maintain constant-mesh with motor drives at all times. Added here are 2 stabilizer bolts for preventing distortion due to extra-heavy loads. Floating hubs "angle" both dangles downward for constant cathodic contact in center of load. Heavier dangle cables are featured for higher current carrying capacity, longer life, better operation. The assembly affords faster dangle cleaning. Slide out hub-lock: 10 secs. Interchange cylinders: 5 mins. Cuts hours off usual time. Total cylinder immersion for increased current density, bigger loads, faster plating, also



prevents gas pockets, eliminates explosion danger. Rugged, all-welded cylinders of "H-T Simcolite" or "Tempcon" hard rubber have heavy-duty, full length, 2" square ribs for longer, harder wear; "full-cycle"; temps to 200°F. Single-screw adjustable motor mount on tank raises and lowers motor drive to mesh with superstructure gear.

These new barrels are stocked in standard sizes, and a replacement series is available to fit all makes of conventional superstructure and tank equipment.

81/Circle on Readers' Service Card

**GOING TO THE A.E.S. ANNUAL
CONVENTION IN CINCINNATI?
WE HOPE SO, BECAUSE...**



TO THE
UDYLITE OPEN HOUSE
AT THE CINCINNATI
A.E.S. CONVENTION

May 19, 20, 21, and 22 in Parlors N-O-P-Q
Ballroom Floor, The Sheraton-Gibson Hotel

COCKTAILS FROM 5 to 7 EACH EVENING
AND

Please plan to attend our "After-Convention" Party
May 22, from 10 p.m. until 2

THE CONTINENTALE ROOM
THE NETHERLAND-HILTON HOTEL

DANCING • COCKTAILS • MIDNIGHT BUFFET



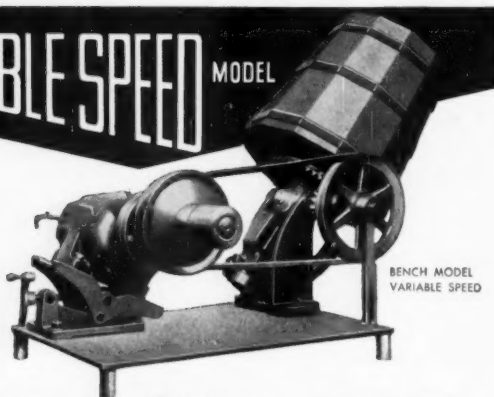
corporation

detroit 11, michigan • world's largest plating supplier

INVESTIGATE THIS TIME-SAVING VARIABLE SPEED MODEL



Bench-Type Single Speed



BENCH MODEL
VARIABLE SPEED

Note Carefully These IMPORTANT POINTS



No. 5—Single Speed

Barrels can be filled with parts or abrasive—while running.



No. 5A—Single Speed

Work can be watched—samples removed for inspection—while running.

Angle can be changed for best abrasive or polishing action—while running.

Barrels can be emptied by tilting to pouring position—while running.

Barrels are made in various sizes, shapes, and materials. They are easily replaced.

If You're a Tumbler, Send
for This NEW CATALOG



No. 6—Single Speed

THE HENDERSON BROS. COMPANY
"The Tumbling Barrel People"
136 SOUTH LEONARD STREET
WATERBURY, CONNECTICUT



No. 5—Variable Speed



No. 5A—Variable Speed



No. 6—Variable Speed

SINCE 1880 DESIGNERS AND BUILDERS OF TUMBLING BARREL EQUIPMENT



82/ Circle on Readers' Service Card

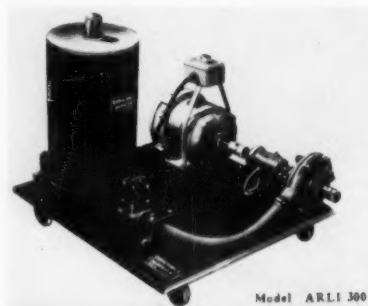
Rubber Lined Filter Pumps

Sethco Mfg. Co., Dept. MF, 2284
Babylon Turnpike, Merrick, N. Y.

The new ARLI series consist of a centrifugal pump coupled by means of a flexible coupling to a totally enclosed motor. The filter chamber is connected to the outlet of the pump by chemical hose. A diaphragm valve located between pump and filter chamber is used for flow regulation. All component parts are mounted on a plastic panel which, in turn, is mounted on casters for portability. Twenty-five feet of chemical hose is furnished. Inlet hose is equipped with plastic strainer. Four

models are available with this series, from 300 to 1200 g.p.h.

Pump body is rubber lined steel, pump impeller is hard rubber. Filter



Model ARLI 300

chamber is high temperature epoxy with hard rubber fittings and filter tubes may be cotton, dynel, porous stone, porous carbon.

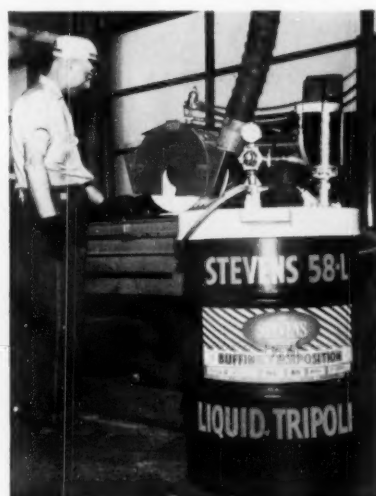
The unit has a 1/2" HP, 3400 rpm motor equipped with approved switches and cords.

Optional equipment includes by-pass—two Uscolite diaphragm valves and necessary hard rubber fittings for straight pumping, by-passing filter chamber.

83/ Circle on Readers' Service Card

Liquid Tripoli Buffing Composition

Frederic B. Stevens, Inc., Dept. MF,
1800 18th St., Detroit 16, Mich.



A new all purpose liquid tripoli buffing compound with vastly improved cutting and cleaning abilities, known as 58-L Liquid Tripoli, is claimed to do an outstanding job of buffing all non-ferrous metals including die castings, copper plate, brass and aluminum.

Originally developed for use in the automotive industry, this new liquid tripoli performed so successfully in the cut, color and "pieces buffed per cwt. of compound" categories that it was decided to make it available to all users of liquid compositions, it is stated.

84/ Circle on Readers' Service Card

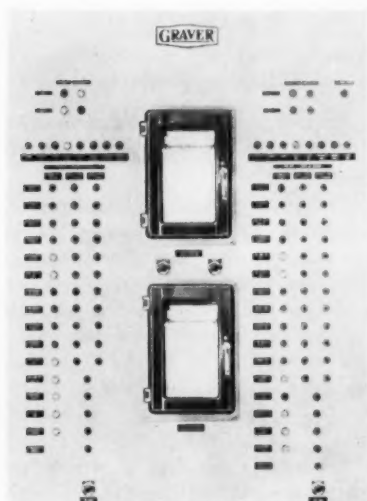
Monitoring System for Automatic Demineralizers

Graver Water Conditioning Co.,
Dept. MF, 216 West 14th St., New
York 11, N. Y.

A new monitoring system to check and indicate malfunction in the operation of its automatic demineralizing

plants has been developed by the above manufacturer. Called the Monitor, the system provides an "electrical shadow" which follows the cycle control sequences and the operation of the automatic valves and auxiliaries. If a valve operation or sequence is not in the proper order or a component of the automatic system is not functioning properly, it receives impulses from a "feedback" and indicates and locates the problem. The unit can be arranged to sound an alarm, shut down the plant or both.

The panel has three basic groups of lights. One group shows if the demineralizing units are in service, regenera-



tion, backwash or rinse. Another group indicates which step in the process is taking place. The third group has a series of three lights for each valve, pump or other auxiliary. The first light is on when the specific valve or item is supposed to be open or running, the second is on when the item is actually open or running and the third is a red light that goes on when the item is not functioning in proper sequence and indicates the cause of the shut down or alarm ringing.

With additional equipment the monitor can be made to keep a permanent record of the demineralizing operation and also to check on its own operation. A lamp test control can be mounted which shows at the push of a button if the panel's lights are in working order. Another indicator lights up if there is a power failure. Other indicators and controls can be included in the panel according to the specific conditions and problems of each plant.

85/Circle on Readers' Service Card

How Pure Need Your Silver Anodes Be? **HANDY & HARMAN MAKES THEM 999+ OR FINER IF YOU SPECIFY**



For general commercial work, Handy & Harman anodes are 999+ fine. And it makes no difference in what shape or size they're made: ball, rod, plate, strip or sheet, they all have the same uniformly high degree of purity. What's more, if you want still finer anodes, you can specify the AA grade for high-speed plating, or finer, if desired. Handy & Harman supplies them all.

Your "fineness need" is our first concern. You can be sure that you'll get *exactly* what you want in anodes from Handy & Harman... thousands of manufacturers will agree.



MANY HAPPY RETURNS

Handy & Harman Refining Service has reached a state of perfection that assures you—in lot after lot—of accurate returns. Your anode ends, plating solutions, precious metal scrap, sweeps and waste are more *rewardingly* handled by Handy & Harman.

HANDY & HARMAN

General Offices: 82 Fulton St., New York 38, N. Y.

DISTRIBUTORS IN PRINCIPAL CITIES

Ship refinings to the nearest of these plants:

WEST COAST
330 N. Gibson Rd.
El Monte (Los Angeles), Calif.

CENTRAL U. S.
1900 West Kinzie St.
Chicago 22, Ill.

EAST COAST
82 Fulton St.
New York 38, N. Y.

Bridgeport 1
Conn.

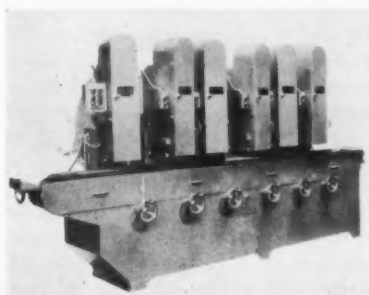
425 Richmond St.
Providence 3, R. I.

86/Circle on Readers' Service Card

Conveyor Type Belt Polisher

Engelberg Huller Co., Dept. MF,
831 W. Fayette St., Syracuse 4, N. Y.

This new conveyor-type abrasive belt



machine makes possible six operations in a single conveyORIZED pass. Model #680-6 is equipped with six individually-adjustable heads. It has a maximum piece capacity of 5" high, 5½" wide, any length. Size of machine's conveyor belt is 7" wide and 268" long. Models are also available with 8", 10" and 12"-wide abrasive belts, with corresponding increases in work-piece capacity. Quick manual adjustment of conveyor belt speed is obtainable for settings of from 2' to 25' per minute.

The unit is designed for both wet- and dry-belt grinding. The machine's self-contained cooling system is powered by two ½ hp. coolant pumps.

Product: 99.75+ % Pure
Service: 100% Sure



Every batch checked. Every can filled with a full weight of extra high quality 99.75+ % Chromic Acid. Prompt delivery from ample factory and nearby distributor stocks. Why not order BFC Chromic Acid next time?

BETTER FINISHES & COATINGS, INC.

268 Doremus Avenue, Newark 5, N. J. • 2014 East 15th St., Los Angeles 21, Calif.



87/ Circle on Readers' Service Card

Abrasive belt size is 6" x 80", and abrasive belt speed is 5500 sfpm. Grinding heads are powered with 7½ hp. drive units.

The machine is 60" wide, 84" high, 158" long. Approximate shipping weight is 7500 pounds.

88/ Circle on Readers' Service Card

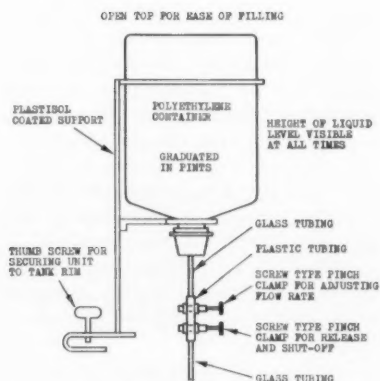
Reagent Dispenser

Wagner Brothers, Inc., Dept. MF, 400 Midland, Detroit 3, Mich.

A new dispenser for adding and metering addition agents to a plating bath is constructed so it can be mounted at any spot on the reinforcing angle rim of a plating tank, supported from

any suitable position over the tanks by a hook, or remotely mounted with extra long tubing.

The dispenser consists of a 2 gallon polyethylene container supported in an inverted vertical position by a plasti-sol coated ring stand. The unit is calibrated in pints, and its rate of additive volume to the bath is controlled by an adjustable type pinch clamp around the plastic tubing. Once the flow rate is regulated, the dispenser need not be disturbed, since a second pinch type clamp makes it possible to shut off the flow. A section of glass tubing extending from the plastic tubing enables additions to be made underneath the plat-



ing bath surface to depths of 12 inches.

89/ Circle on Readers' Service Card

Baking Enamels

Pittsburgh Plate Glass Co., Industrial Finishes Div., Dept. MF, Pittsburgh 22, Penna.

The basic 100 series, the Duracon super line of thermosetting acrylic baking enamels, offers best all around performance, combining hardness, color retention, and chemical resistance with outstanding flexibility and toughness, and is satisfactory for both exterior and interior applications. Baking schedule is 30 minutes at 350°F or equivalent.

Advantages are that it permits replacing present 2 or 3 coat systems with one coat with equal or superior performance. It can be used wherever outstanding appearance and durability are required. The resins lend themselves to broad modifications of solubility and film characteristics, and thus are applicable to a wide variety of industrial applications ranging from spraying or dipping enamels and clears where utmost corrosion resistance or durability is required to roll coat finishes for metal decorating, where flow and extreme fabrication are essential.

The Duracon 200 series is very hard and stain proof. It is more brittle than the 100 series, and is recommended for interior use only. Baking schedule is 30 minutes at 300°F or equivalent. This series offers a porcelain-like organic finish to be used where extreme flexibility is not required but where hardness, stainproofness, and inertness are paramount. It can be used as a single coat because of excellent gloss, build and appearance, as well as necessary protective resistance. For the ultimate in corrosion resistance or

where additional filling may be desired, it can be used over conventional primers.

The 300 series offers the most economical finish. Not equal to 100 and 200 in hardness, stain and chemical resistance it is still superior to conventional alkyd-amine finishes. It has better flexibility than the 200 series. It is recommended for interior use only. Baking schedule is 30 minutes at 300°F. or equivalent. This series offers a finish that costs no more than ordinary alkyd-amine finishes, but with real advantages in appearance, hardness and stain resistance. It suggests itself for use as a one coat enamel, or as a top-coat with various type primers to obtain advantages over present baking enamels at no increase in cost. It can be obtained as a clear, as a white, or in any desired color.

90/Circle on Readers' Service Card

Spray Nozzles

*Spraying Systems Co., Dept. MF,
3245 Randolph St., Bellwood, Ill.*

Because equipment often provides limited space for the installation of spray nozzles, the above manufacturer has designed a new line of FullJet spray nozzles with the body of the nozzle providing a 90° angle elbow turn. Where the spray must be directed at a 90° angle to the inlet pipe, these nozzles may be installed without use of additional fittings. Identified as the 1/2-GA series, these nozzles provide a full cone spray pattern with uniform distribution. Choice of spray angles are offered in the standard 65° angle type and wide angle 120° type. Typical applications



METAL FINISHING, May, 1958

clepco
FUSED QUARTZ
IMMERSION HEATERS

**FAMOUS THROUGHOUT
THE PLATING INDUSTRY**
For Quality, Efficiency, Low Cost Operations

OVER 100,000 INSTALLATIONS
For alkaline or acid heating jobs, you can depend on
CLEPCO ELECTRIC IMMERSION HEATERS

CLEPCO STEEL and STAINLESS HEATERS
will meet all your specific needs.

Low Heat Density — Long Life — Vapor-proof junction Box.

See Your
Plating Supply
House.

SEND FOR COMPLETE INFORMATION
THE CLEVELAND PROCESS COMPANY
1965 EAST 57TH STREET • CLEVELAND 3, OHIO

92/Circle on Readers' Service Card

include installation in equipment for cooling and washing.

91/Circle on Readers' Service Card

Corrosion-Resistant Flooring

*Pennsalt Chemicals Corp., Dept. MF,
Three Penn Center, Philadelphia 2, Pa.*

Penntrol is a thermosetting coating which resists strong acids (including hydrofluoric), alkalis, and solvents, supports heavy duty traffic and withstands temperatures of 230°F.

Available in three grades to meet specific requirements, the coating is packaged in convenient sizes for easy mixing of correct proportions of resin,

filler and hardener. Standard unit for the "Regular" weighs 210 pounds (resin, 45 lb.; filler, 160 lb.; hardener, 5 lb.). The "Carbon" unit weighs 150 pounds (resin, 45 lb.; filler, 100 lb.; hardener, 5 lb.). The "Floor Surfacers" weighs 320 pounds (resin, 45 lb.; filler, 270 lb.; hardener, 5 lb.).

No special storage facilities are necessary because of the product's stability. Mixtures can be made conveniently right on the job, and down-time is kept to a minimum because the coating sets quickly. Lined surfaces cure over night, and harden to a durability of good concrete.

When mixed, the material has a but-

ter-like consistency, which can be troweled on both horizontal and vertical concrete, brick, or cement block surfaces. It forms a bond stronger than the surface being covered and seals out moisture so that there is no scaling or sloughing off.

The coating has been engineered for all types of plant floors, walls, foundations and piers. Depending on conditions, thicknesses range from $\frac{1}{16}$ to $\frac{3}{16}$ inches, with $\frac{3}{32}$ -inch thickness being average.

93/Circle on Readers' Service Card

Gas Scrubbing Tower

The Ceilcote Co., Dept. MF, 4844 Ridge Road, Cleveland 9, Ohio.



Gas scrubbing towers capable of resisting highly corrosive gases and extreme temperatures are now being fabricated completely from Duracor reinforced plastic for the chemical and metalworking industries.

To provide maximum heat resistance to gases entering the scrubbing tower at temperatures up to 300°F., the scrubber shown was fabricated from a special 3000 Series resin. Other grades offer combinations of special chemical, flame and abrasion resistance. Important physical properties of Duracor include tensile strength ranging from 11,000 to 15,000 psi and flexural strength from 20,000 to 30,000 psi.

94/Circle on Readers' Service Card

Combination Tumbling-Plating Barrel

Belke Mfg. Co., Dept. MF, 946 N. Cicero Ave., Chicago 51, Ill.

Convenient, low cost finishing of samples and small lots of all kinds is made possible by a new laboratory unit. The hinge-mounted drive tilts

Shape of things to Come—in Copper

Plated Moulds, Inc., finds even heavy, intricate molds are plated faster—deposits are smoother, denser, more uniform—with "Plus-4" (Phosphorized Copper) Anodes

"Plus-4"® Copper Anodes have helped Plated Moulds, Inc., Yonkers, N. Y., open up new areas of business in electroformed copper molds for the mass production of intricately shaped products in vinyl plastisols.

A leader in the production of copper molds for dolls and toys, Plated Moulds also pioneered in making the molds for plastic footwear. About three years ago, the company tried "Plus-4" Anodes in its tanks with these results:

1. Deposits were uniform, with excellent density. They had experienced some porosity with ordinary anodes.
2. There were far fewer nodules. This was particularly important in building up shells as thick as $\frac{1}{4}$ ".
3. They could plate faster, using higher current densities.

4. Efficiency in copper use was higher because the anodes corroded more uniformly.

5. Tank maintenance was reduced. There was less sulfate—no sludge.

These advantages made it practical and economical to try larger, heavier molds. The hobbyhorse mold illustrated is one result. And Plated Moulds is moving out into the commercial and industrial fields with molds for motorcycle and bicycle seats, automotive assemblies, display models.

Write for information on how you can obtain a test quantity to supply one tank. Address: The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

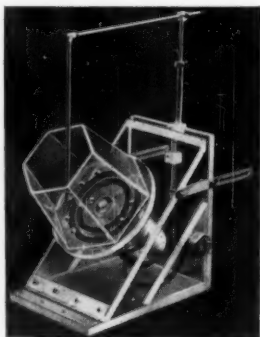
66104

ANACONDA®

"PLUS-4" ANODES Phosphorized Copper

Made by The American Brass Company

back for plating with the cylinder in oblique position; adjusts for burnishing with the cylinder in the horizontal position. Plating and burnishing cylinders



set on the drive shaft without fastening — lift right off for emptying or changing from one cylinder to another. The plexiglas plating cylinders hold most any plating solution. They are smooth inside and successfully plate even the smallest pointed objects. The button contacts are easily removed, to permit changeover from gold to zinc, copper, etc., in seconds.

Plating cylinders are available in two sizes, with inside diameters as follows: (1) 5" deep; 4" diameter at small end and 5½" diameter at the large end, (2) 4" deep, 3½" diameter at the small end; 4" diameter at the large end.

The burnishing cylinder is made of



At right, the 76-pound electroformed copper mold in which the beautifully detailed, 28" vinyl plastisol hobbyhorses are cast. Plated Moulds, Inc., is now working on molds weighing up to 250 pounds.

95/Circle on Readers' Service Card

plexiglas with screw-on cover. Inside dimensions are 5" long and 4" diameter. Motor is 115 volt, 60 cycle, single phase.

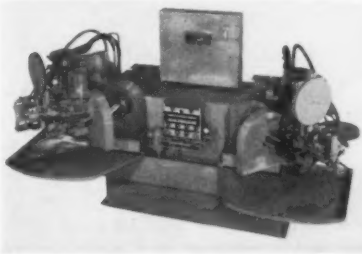
96/Circle on Readers' Service Card

Sunray Machine

Hi-Lite Polishing Machine Co., Inc., Dept. MF, Route #2, N. 44th St., Sheboygan, Wis.

Model SBSR 12" is a double spindle automatic machine for producing sunray finishes on the inside of round pots, pans, utensils or items having a general minimum diameter of 5½", to a maximum diameter of 12". General maximum depth of item is 6" deep.

Two vacuum chucks are used to hold the items, the operator loading one side while the other is going through its automatic cycle. Speeds and feeds are completely variable and dependent on condition of the surface to be polished. Coated abrasive used is 1" wide



and automatically indexed from 50 yard rolls.

Stock removal and finishes produced are far superior and at a rate several times over hand methods. Quick changeover time and complete versatility were prime considerations in the design of the machine.

97/Circle on Readers' Service Card

Barrel Finishing Machine

Almco, Queen Products, Inc., Dept. MF, Albert Lea, Minn.

A new barrel finishing machine, designed for processing small and medium lots of parts, is equipped with a built-in media separating system. The new Model DBO-2A features a twin



compartment, 5.6 cu. ft. neoprene lined barrel and built-in screening drawers to handle discharged loads from each compartment.

Not only does its built-in separating system eliminate the need for accessory media separator equipment, but the "2-barrels-in-1" feature allows simultaneous deburring and finishing of different types of work parts in one machine. A wide range of barrel speeds from 8 to 38 rpm adds to the ability of the unit to perform all types of finishing operations requiring close tolerance specifications.

Although it requires less than 12 sq. ft. of floor area for installation, the new machine can handle total work loads up to 700 lbs.

98/Circle on Readers' Service Card

Conveyor Carriers

The Alvey-Ferguson Co., Dept. MF, 2549 Disney St., Cincinnati 9, Ohio.

A greatly enlarged line of engineered attachments and carriers for its overhead trolley conveying systems is offered by the above manufacturer.

Among the carriers in the line are

PERMAG FOR EFFICIENT METAL CLEANING

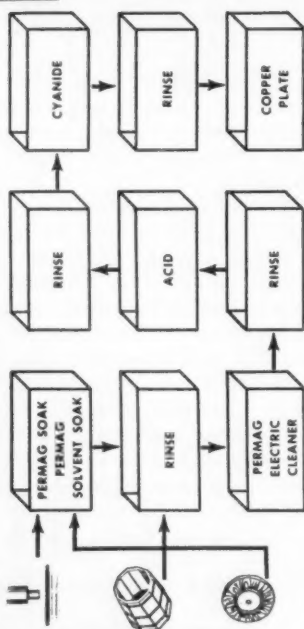
Your most difficult metal cleaning jobs can be solved through our practical knowledge and long experience. PERMAG technical, shop-trained representatives are ready to make a service visit—write today, no obligation. **FREE** — send for this handy, vest-pocket electroplater's cleaning manual... it's yours for the asking.



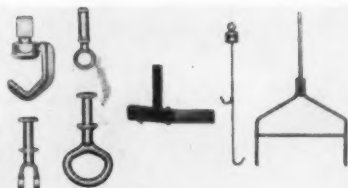
MAGNUSON

PRODUCTS CORPORATION
50 COURT ST., BROOKLYN 1, N. Y.

Executive Offices: 50 COURT ST., BROOKLYN 1, N. Y.
In Canada: Canadian PERMAG Products, Ltd., Montreal



99/ Circle on Readers' Service Card



standard and offset tray carriers, multiple hook carriers, cylindrical parts carriers and other applications of hooks, tongs, racks and baskets.

100/ Circle on Readers' Service Card

Rotary Air and Vacuum Pump

Leiman Bros., Inc., Dept. MF, 102 Christie St., Newark 5, N. J.

The above manufacturers have re-designed their oil-less rotary air and vacuum pumps to incorporate a rotary shaft seal which prevents leakage of air into the pump, and also prevents leakage of the medium being pumped to atmosphere.

The use of the shaft seal permits the pump to be used for any operation where the medium cannot be contaminated by oil or mixed with the atmosphere.

101/ Circle on Readers' Service Card

Thermosetting Acrylic Finish

Interchemical Corp., Finishes Div., Dept. MF, Newark 1, N. J.

Vitrilan is a thermosetting acrylic finish based on a cross-linking acrylic polymer. Of particular interest to the manufacturer of home laundry equipment is its exceptional resistance to soaps and detergents. It exhibits excellent color retention when subjected to both light and heat. In heat resistance it is surpassed only by silicone enamels costing two or three times as much, it is claimed.

The finish provides excellent gloss and build, resistance to abrasion and to staining by foods, drugs and other household deteriorants. It sprays freely without cob-webbing in standard spray equipment. Baking schedule is 350°F. for 30 minutes or equivalent.

102/ Circle on Readers' Service Card

Burnishing Compounds

Time Chemical Corp., Dept. MF, 11-23 St. Casimir Ave., Yonkers, N. Y.

The above manufacturer announces the introduction of two new burnishing compounds. Extensive production field tests on #559 indicate good leveling and brightness on a wide variety

Atlas

PICKLE TANKS END COSTLY REPLACEMENT



... outlast wood 10 to 1!

Wooden tanks, because of their inherent instability, create a continuous maintenance and replacement problem. Atlas construction uses corrosion-resistant linings and acid brick joined with the proper corrosion-proof cement to end maintenance problems and give a service life of 10 to 1 over wood. Atlas tanks provide positive corrosion protection.

As there is no drying out or change of dimensions, Atlas tanks will not leak. In addition, they are engineered to withstand hard physical abuse from shifting loads. They resist all pickling solutions even when used at today's elevated temperatures. Atlas pickle tanks put an end to your costly replacement problems. Write for Atlas Bulletins 5-2 and C-1.



MERTZTOWN, PENNSYLVANIA

103/ Circle on Readers' Service Card

of metals, as well as electroplated parts. Excellent results are reported on steel, stainless steel, brass, brass plate, yellow brass, tin plate, nickel and silver after burnishing with steel balls or stones. #525 is recommended for use on the metals mentioned above as well as die cast zinc and aluminum.

It is claimed that these compounds are based on an entirely new concept of formulation with emphasis on good lubrication and producing bright, clean, filmless surfaces ready for subsequent finishing operations, such as lacquering or plating. Prices on both these new burnishing compounds compare favorably with the present cost of raw soap.

104/Circle on Readers' Service Card

Cyanide Copper Processes

L. H. Butcher Co., Dept. MF, 3628 E. Olympic Blvd., Los Angeles 23, Calif.

Two new cyanide copper plating processes have been announced by the above firm.

Buf-R-Brite Process No. 10 is said to be soft, easily buffed, have a wide plating range, with high speed. Buf-R-Brite Process No. 30 is the same process as No. 10, plus Addition Agent No. 30 for bright, fine grained deposits. It is said to be excellent over die castings, with no cleaning needed prior to nickel plating.

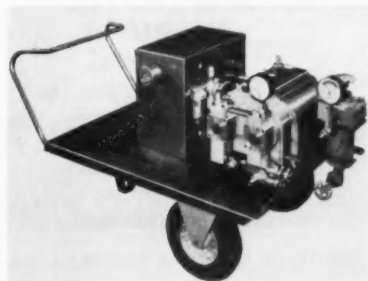
Both processes feature simple control, economy, and quality.

105/Circle on Readers' Service Card

Pumping Unit for Airless Spraying

Nordson Corp., Dept. MF, Amherst, Ohio.

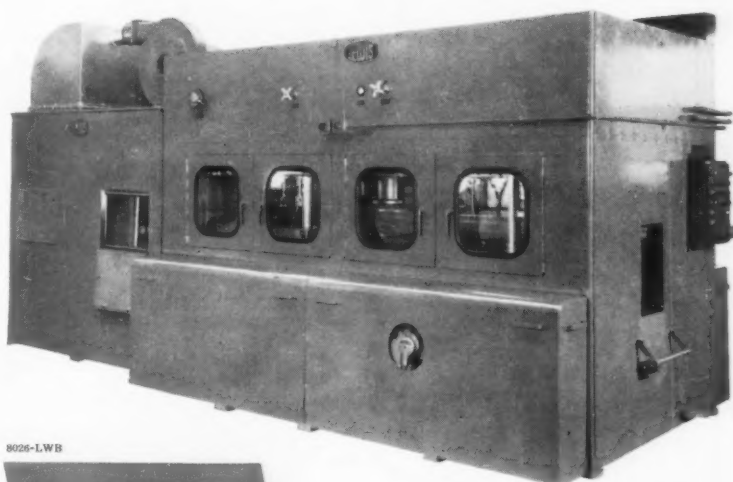
A new pumping unit for use in airless and hydraulic spray coating systems, designated as Model AP, combines light weight with rugged construction. In addition to features such as overlapping piston action, automatic speed control, and self-cleaning piston rods, this new model features



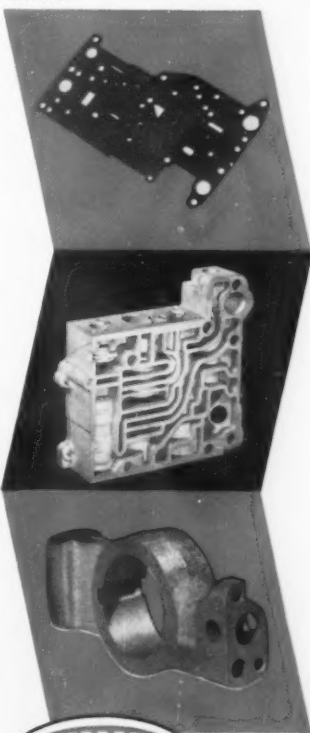
*Lewis
presents*



the **FIRST** fully automatic
metal finishing machine



8026-LWB



new liquid abrasive
process produces finishes
to 12 R.M.S. on 320 parts
per hour

Featuring unique automatic methods . . . special blast-gun design . . . one-man operation . . . machine tool construction, MICRO BLAST machines create substantial cost savings in metal parts finishing. Precision controls and variable abrasive slurry permit a wide range of uniform, microscopically smooth surface finishes in production quantities.

The Type 210 twin-belt design illustrated handles a variety of shapes, including the parts shown at left. All operations, except parts feeding, are automatic. The conveyorized rinse and dry cabinet finishes up to 320 parts per hour.

Lewis MICRO BLAST machines are custom designed for versatility and the most efficient handling of finishing problems. Our engineers will help analyze your needs and make specific recommendations.

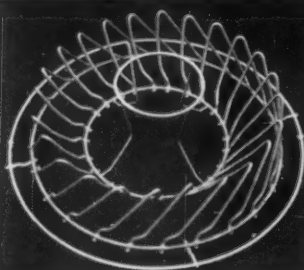
FOR ADDITIONAL DETAILS, WRITE FOR NEW BULLETIN MB-100 . . . or call Bedford 2-2500.



THE LEWIS WELDING & ENGINEERING CORP.

106 NORTHFIELD ROAD • BEDFORD, OHIO

Designers • Engineers • Fabricators • Machinists



COLD DIP COATINGS

Looking for a plastisol to give you heavy, uniform coatings without preheating your product before dipping?

Then look to Reynsol—America's fastest growing plastisol for cold-dips. Products such as dish drain baskets, gloves, boots, cable, wire—in fact any product of metal, fabric, wood or paper can be successfully cold dipped with Reynsol.

COLOR	UNLIMITED
WEIGHT	SP. GR. 1.20
FIRE HAZARD	LITTLE OR NONE
% FILM FORMING	95% to 100%
VISCOSITY	10,000 TO 15,000 CPS.
AGING PROPERTIES	GOOD
COLD PROPERTIES	FLEXIBLE AT 65° F
LIGHT RESISTANCE	GOOD
TYPE OF SURFACE	DRY AND GLOSSY
TENSILE STRENGTH	VERY GOOD
SCUFF RESISTANCE	VERY GOOD
ABRASION RESISTANCE	VERY GOOD
ALKALI RESISTANCE	VERY GOOD
ACID RESISTANCE	VERY GOOD
OIL RESISTANCE	VERY GOOD
HARDNESS	AS HIGH AS 80 (SHORE-A)
COST PER .001 INCH THICKNESS	APPX. \$.034 SQ. YD.

Member Vinyl Dispersion Division, SPI



ANN ARBOR, MICHIGAN
DIVISION OF STUBNITZ GREENE CORP.
107/Circle on Readers' Service Card

throw-away packing glands, chrome plated air cylinders and complete accessibility of all expendable parts with a minimum of disassembly.

Designed to operate at pressures up to 1500 psi and at temperatures up to 500° F, this new pump can be used for applying all types of coating materials including plastisols and hot melt resinous materials. As in previous models, the new pump is designed for either siphon or pressure feed operation. It is capable of delivering material at the rate of 1½ gallons per minute providing for multiple spray gun hookup. As many spray guns as desired can be operated from one pumping system as long as the total delivery of the guns does not exceed the capacity of the pump. The pump can deliver the finishing or coating material directly to the spray guns or through a paint circulating system.

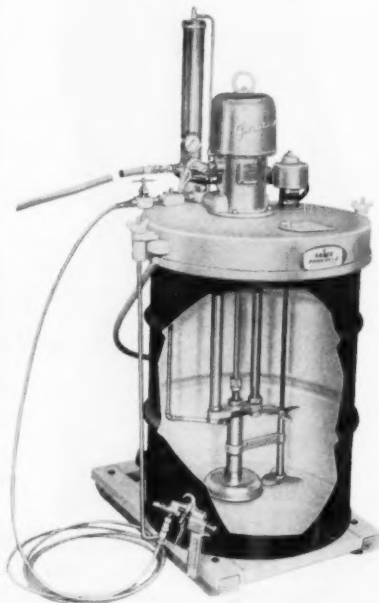
Besides applicability to all standard production applications, the new pump can be used for maintenance painting by mounting on a portable dolly.

108/Circle on Readers' Service Card

Paint Spraying Process

Gray Co., Inc., Dept. MF, 1018 Sibbey St. N.E., Minneapolis 13, Minn.

A new paint spraying process eliminates the need for atomizing air, heat or excessive solvents. Graco "Hydra-Spray" utilizes a combination of high fluid pressure and a small fluid nozzle to create fine material breakup without atomizing air, reducing overspray.

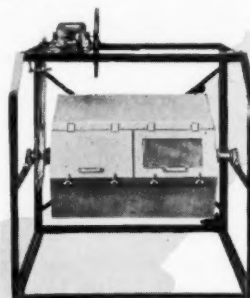


Your Key to BETTER FINISHING

Only **KRAMER'S** Tumblers and Buffers give you **SUCCESSFUL PRECISION FINISHING** with high savings.

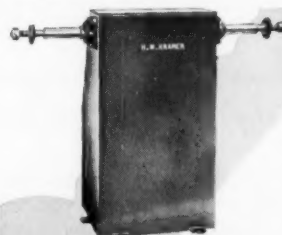
Yes!

Kramer's Noiseless, chain-driven Tumblers CUTS DOWN YOUR LABOR COST... DEBURRS, DEFLASHES, POLISHES to give you the "PERFECT FINISH LOOK" desired to meet your highest standards.



SINGLE BARREL TUMBLER

Size: 30" x 36" or engineered to your specifications. Barrels lined with kiln-dried and glued maple. Child's play to operate. Economical on space as motors are individually mounted overhead—double decked or single. Tumbling supplies available also.



BUFFING LATHE

1 to 7½ H.P. Ball Bearing V-Belt Drive. Pre-determined speed set at factory or to your specifications. Buffing wheels and compounds available for every industry... Special compounds recommended for Special applications.

Write Dept. MF for Detailed Information

H. W. KRAMER CO.
120-30 JAMAICA AVENUE
RICHMOND HILL 18, N. Y.

109/Circle on Readers' Service Card

bounce-back and hazardous fumes to an absolute minimum.

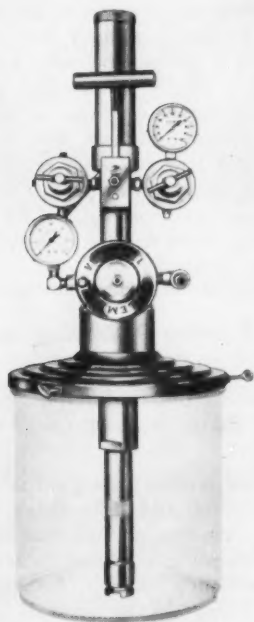
Because this new unit uses a specially engineered, air-powered pump that produces fluid pressure 20 times that of the inbound air pressure, no heat or excessive solvent is required to reduce paint viscosity to a sprayable consistency, resulting in better coverage and simplified equipment.

Being air-powered, the pump exerts no pressure in the container, eliminates costly electrical connections and operates only while spraying.

110/Circle on Readers' Service Card

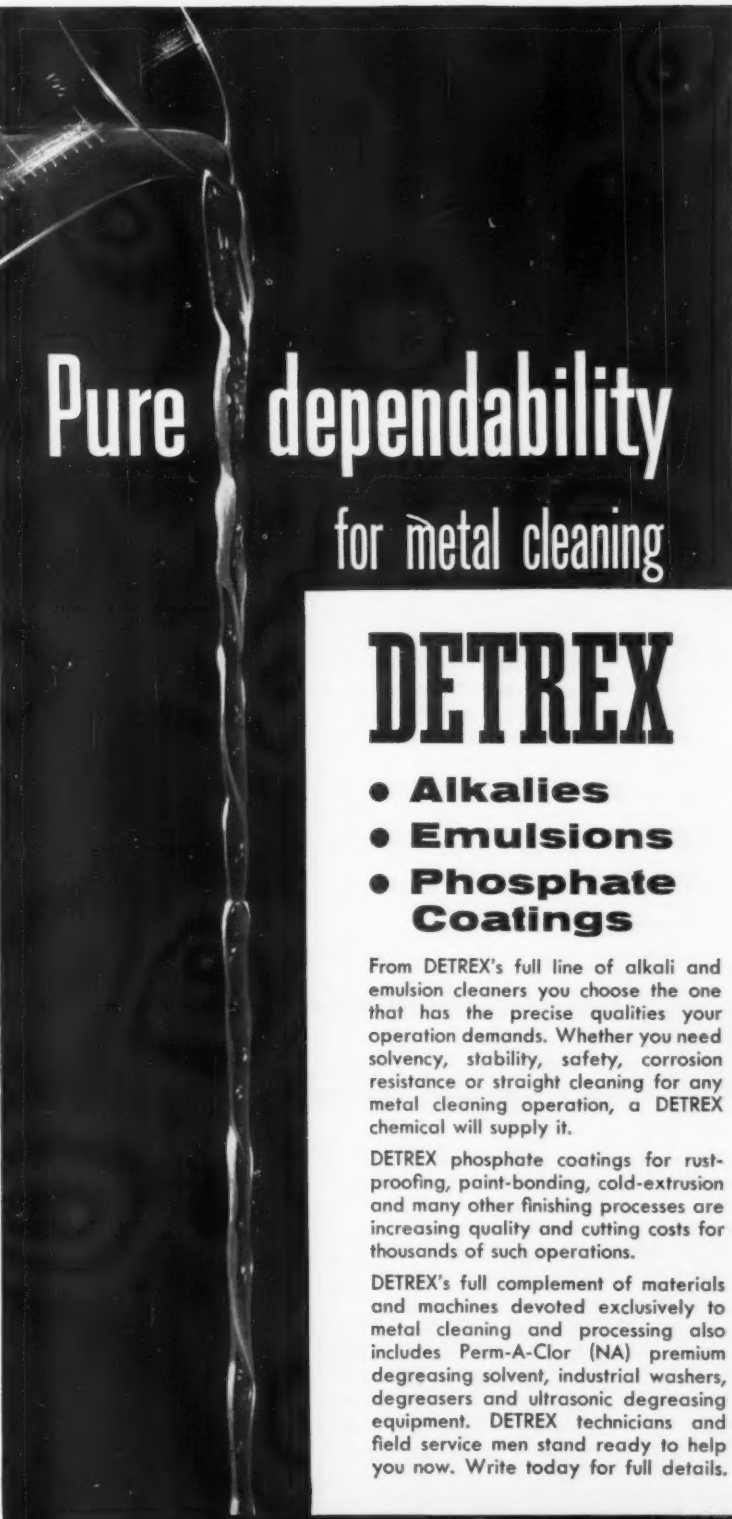
Portable Paint Pump

Alemite Div., Stewart-Warner Corp.,
Dept. MF, 1826 Diversey Pkwy., Chicago 14, Ill.



An economical, portable, air-powered pump, the new Versatal "Porta-Paint" pump handles a wide range of protective and finishing materials, lacquers, enamel, primers, sealers, vinyls, epoxys, urethanes, spray booth and strippable coatings, directly from five-gallon containers.

Ideal for short run production and metallic base paint applications, the new pump offers fast color change-over by merely operating the fully-assembled pump in solvent. Automatic, constant agitation assures full color consistency regulated by precision air and materials controls mounted on the pump. A full power "2 to 1" ratio



Pure dependability for metal cleaning

DETREX

- Alkalies
- Emulsions
- Phosphate Coatings

From DETREX's full line of alkali and emulsion cleaners you choose the one that has the precise qualities your operation demands. Whether you need solvency, stability, safety, corrosion resistance or straight cleaning for any metal cleaning operation, a DETREX chemical will supply it.

DETREX phosphate coatings for rust-proofing, paint-bonding, cold-extrusion and many other finishing processes are increasing quality and cutting costs for thousands of such operations.

DETREX's full complement of materials and machines devoted exclusively to metal cleaning and processing also includes Perm-A-Clor (NA) premium degreasing solvent, industrial washers, degreasers and ultrasonic degreasing equipment. DETREX technicians and field service men stand ready to help you now. Write today for full details.

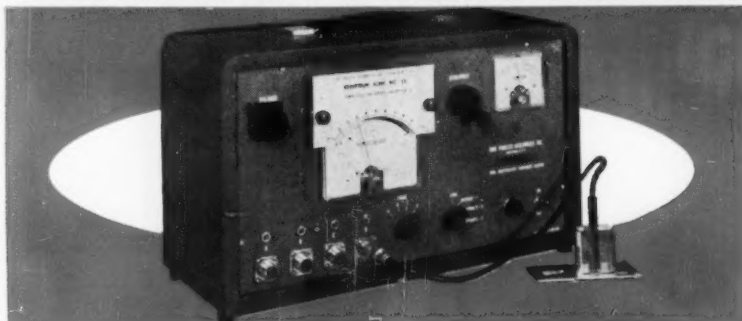
DETREX

CHEMICAL INDUSTRIES, INC.

BOX 501, DEPT. MF-5, DETROIT 32, MICHIGAN

**THE NEW VERSATILE
NON-DESTRUCTIVE
COATING-THICKNESS
TESTER**

DERMITRON



Unit Process Assemblies, Inc., pioneers in non-destructive testing and specialists in electronics for metal finishing, offer their latest DERMITRON D-2 with these features:

- Measures plated coatings on steel, brass, copper, zinc die-cast, aluminum, nickel-silver, bronze and other metals; also nickel on steel.
- Measures anodize and hard-coat on aluminum and magnesium; also paint, porcelain, organic coatings on non-ferrous metals.
- Measures metal coatings on plastics, ceramics and other non-metallic materials.
- Sorts or matches metals and alloys.
- Available with FOUR measuring probes for extra-wide thickness ranges from thin to thick deposits.
- Special probes can be provided for measuring on internal diameters, small diameters and otherwise inaccessible areas.
- Only $\frac{1}{8}$ " circle area required for measurement.
- You get fast (within seconds), accurate, direct readings, plus versatility and portability.

Write for latest brochure and questionnaire to help solve your thickness testing problems.

UPA

UNIT PROCESS ASSEMBLIES, INC.

61 East Fourth Street • New York 3, N. Y.

112/Circle on Readers' Service Card

pump delivers a constant flow of material providing an ample supply at the spray gun even through exceptionally long hose lines.

Compact and lightweight design permits easy portability and no dollies are required to move the unit to the job, even with a full container.

Pump and accessories are zinc plated. Cover is finished in red enamel. Air inlet is $\frac{1}{4}$ " NPTF; outlet, $\frac{3}{8}$ " NDSM, and the material outlet is $\frac{3}{8}$ " NDSM. The entire unit weighs but 35 pounds and consists of pump, cover, handle, air regulator to pump, atomizing air regulator and gauge, and material pressure regulator and gauge.

113/Circle on Readers' Service Card

Dry Chemical Extinguisher

The Fyr-Fyter Co., Dept. MF, 221 Crane St., Dayton 3, Ohio.

Known as the Model 23-1, this portable 21½ pound pressure extinguisher is recommended where on-the-spot protection is desired against incipient fires in gas, oil, paint, propane, chemicals, and electrical equipment.

Depression of the squeeze lever spreads a 60° wide angle blanket of non-freeze, non-toxic, non-conducting dry chemical power to a range of 12 feet. The unit is Underwriters' rated at 2-B, C.

The gleaming chrome-plated case is both corrosion resistant and conspicu-



ous for quick location in emergencies. Operating at a pressure of 150 psi and with pressure constantly indicated on a built-in gauge, the unit has been tested to 450 psi without damage. Accompanying bracket can be mounted near probable hazards, and the compact unit may be easily stored. New rubber valve assembly is said to be leakproof and foolproof, and the manufacturer claims recharging is quick and relatively simple.

114/Circle on Readers' Service Card

Vacuum Metalizing on Polyethylene

Syn-Cote Chemical Corp., Dept. MF, 44-27 Purvis St., Long Island City 1, N. Y.

A new process is designed to fit into conventional metal decorating plants. Special top coat and base coat lacquers were developed to achieve the flexibility and adhesion required for polyethylene. These new lacquers are storage stable, easy to use and perfectly formulated for optimum film properties on polyethylene. The coated and metalized polyethylene articles can be dyed by conventional methods to any desired shade.

115/Circle on Readers' Service Card

Grain Refiner for Cadmium

Conversion Chem. Corp., Dept. MF, Rockville, Conn.

A new leveling and grain refining agent for cadmium plating solutions producing semi-bright deposits, Kenvert #25, has been designed to modify the grain structure of cadmium plate to guarantee uniform results with chromate conversion coatings. It guaran-

tees bright uniform results with dilute one-dip treatments, and is claimed to eliminate cloudy effects associated with this bright dipping.

The addition agent improves the throwing power of the bath and reduces burning. It gives consistent colored chromating results with iridescent or olive drab treatments. The product is an all organic addition agent, therefore it does not cause difficulty in soldering. The deposit remains soft and ductile, it eliminates pores in the plate caused by some addition agents, and greater cathode efficiency results, it is stated.

116/Circle on Readers' Service Card

Paint Remover for Hands

Mark Kevin Co., Dept. MF, 6651 Washington Ave., University City 5, Mo.

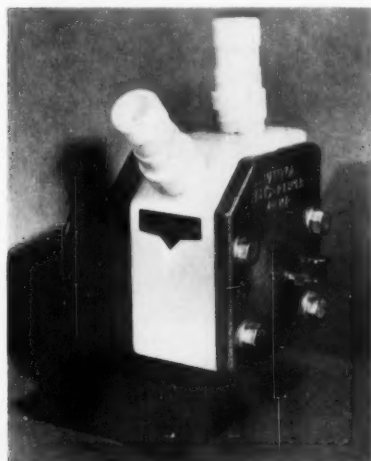
A new, highly effective compound for removal of paint, lacquer, adhesives, and other resinous products from the hands, Mar-Kev hand cleaning compound thoroughly dissolves away pigmented and resinous substances and, at the same time, protects the skin by reason of its lanolin content.

117/Circle on Readers' Service Card

Plastic Pump

Vanton Pump & Equip. Corp., Dept. MF, 201 Sweetland Ave., Hillside, N. J.

The new Marlex 50 polyethylene construction makes it possible to handle extremely corrosive fluids at temperatures up to 260°F. In addition to the increased temperature range the new material possesses a close dense molecular structure which results in



high tensile strength and low permeability.

The new pump has a wide variety of interchangeable plastic body blocks and rubber or synthetic flex-i-liners and is available in capacities from 1/3 - 10 gpm.

119/Circle on Readers' Service Card

Non-Spotting Skin Creams

Milburn Co., Dept. MF, 3216 E. Woodridge, Detroit 7, Mich.

A corrosion-resistant ingredient which prevents spotting of highly finished metal surfaces by workers' perspiration or finger-prints is now a part of the above manufacturer's skin protective lotions. The anti-corrosion fac-

tor is dispersed in a water-soluble plastic film which is deposited on the skin by evaporation of Ply No. 9 Liquid.

As the worker perspires, his perspiration carries with it a portion of the corrosion-retardant from the water-soluble film. This counteracts the salts, acids and moisture of the perspiration and prevents spotting or corroding of the metal surface. The continuous, flexible plastic film which is deposited on the skin by evaporation of the barrier liquid is impervious to kerosene, petroleum-type cutting oils and solvents, and to most common hazards met in machining and inspection of metal parts.

120/Circle on Readers' Service Card

PROCESSING ALUMINUM?

... Call Cowles for chemical know-how *

*

AL CLEANS

and how it cleans! Yet here's an aluminum cleaning compound specifically designed for soak tank removal of drawing, stamping, spinning compounds, rolling oils, marking inks and crayons, and general shop dirt *without attacking* the metal itself, when used as directed. Cowles AL provides high detergent potential at comparatively low concentrations ... has excellent rinsing properties ... can be used in pressure spray washing machines without foaming ... will not cake if kept dry ... produces clear solutions, and can be used in hard or soft water.

*

AK ETCHES

with ease and efficiency! This unique formulation works on all aluminum alloys and prevents formation of aluminum oxide scale by means of a special sequestering agent. No more scale means no more down-time for costly clean-up ... less chance for coil and tank damage in maintenance ... better temperature control ... longer solution life, with lower product consumption ... greater operational safety through the elimination of mid-shift dumping. Cowles AK gives a more uniform finish for plus results through easier inspection, quality improvement and increased end product sales appeal.

*

DO DE-SMUTS

without hazard to safety! Personnel problems connected with the handling dangers of liquid acids disappear overnight with powdered acid Cowles DO. Highly efficient, DO solutions de-oxidize the primary aluminum oxide film rapidly, then re-oxidize the metal surface slowly and uniformly with an air-stable oxide film and no residue of smut. Surfaces are super-clean for spot-welding, anodizing or chromate finishing. Recommended cleaning concentrations and solution temperatures are low—total solid content remains low ... rapid drying-on is inhibited ... residual film is minimized ... rinsing is facilitated.

FOR OUTSTANDING RESULTS in aluminum processing,
send for technical data sheets today.



CHEMICAL COMPANY

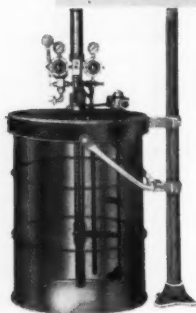
7014 EUCLID AVE. • CLEVELAND 3, OHIO



118/Circle on Readers' Service Card

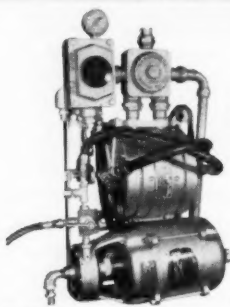
Here's why **YOU** should use **SPEE-FLO** **HOT SPRAY SYSTEMS**

One coat replaces two
... improved coverage
... better build ...
faster drying ... no
holidays ... longer lasting, smoother finish
... savings in maintenance and materials.



SPEE-FLO **PAINT PUMPS**

- OPERATE from original container.
- DIVORCED ACTION ...
air motor sealed off from pump.
- BUNG OR DRUM-COVER MOUNT.
- AIR MOTOR MIXER
- UP TO 3 GPM.
- DOUBLE-ACTING ...
2-to-1 ratio delivers on both strokes.
- FAST CLEANOUT



SPEE-FLO **HOT SPRAY HEATERS**

- SIMPLE ... turn them on, ready in 5 minutes. Turn them off ... exclusive construction eliminates daily cleanout.
- EFFICIENT ... full heating range, 90-180°F. Easy, accurate control ... coil-less design prevents clogging.
- PROVED ... local distributors and trained Speed-Flo engineers give on-the-job demonstrations ... let you evaluate them on your own job.

WRITE FOR
FREE BOOKLET



SPEE-FLO

6614 HARRISBURG • HOUSTON 11, TEXAS

121/Circle on Readers' Service Card

Alkaline Cleaner & Deruster

Magnus Chemical Co., Inc., Dept. MF, South Ave., Garwood, N. J.

A new product for the removal of light films of oil, shop dirt, paint and rust deposits from ferrous metal parts, 61-DRX, is a white, granular mixture of strong alkalies containing a special corrosion solubilizing compound and a wetting agent. It is recommended especially for jobs where an emulsifier is desired to remove light films of oil and grease as well as paint and light deposits of rust. The wetting agent in the material aids in fast penetration so necessary in the stripping of paint,

enamel and lacquer from ferrous metals.

It is normally used at concentrations of one half to three pounds per gallon of water heated to 200° to 210°F. This product releases no corrosive fumes as do acid type pickling compounds.

122/Circle on Readers' Service Card

Coating Thickness Tester

Gulton Industries, Dept. MF, 212 Durham Ave., Metuchen, N. J.

A new instrument is designed for the precise and non-destructive measurement of the thickness of coatings and



platings on base materials. Known as the Glennite Laminagage, Model FLW-1, it can be used for the thickness measurements of metallic film or foil and it will detect surface and subsurface cracks in smooth and rough coatings, flat stock or plate and tubing. In addition it can be used to measure coating thicknesses of odd shaped pieces and on assembly lines where the thickness of coatings must be continuously monitored. The instrument is also designed for use in automated, process control applications, for which the manufacturer will provide the necessary engineering services.

Operating on the swept frequency eddy-current principle, the unit will measure coating thicknesses over the range of 0.00005" to 0.007" with an accuracy of 10%. With the instrument featuring extremely high resolution and stability, ferrous and nonferrous materials and a wide range of conducting and non-conducting coatings on conducting base materials can also be measured.

As conductivity and permeability differ, each application demands its own frequency, band width, calibration and probe. Oscillator units, probes and calibration charts supplied with the instruments, are interchangeable and may quickly and easily be replaced.

123/Circle on Readers' Service Card

Acid Fume Depressant

Swift & Co., Technical Products, Dept. MF, 1800-165th St., Hammond, Ind.

Akweons #250, a new acid fume depressant, is said to greatly reduce acid fumes in pickling and electroplating

operations. It is effective with most acids including hydrochloric and sulfuric acid over a wide range of temperature and acid concentrations. The material has no corrosion inhibition properties, so it can be used where etching or acid attack is desirable.

The product is also a wetting agent and has detergent or cleaning properties for metals in most pH ranges.

124/Circle on Readers' Service Card

Acid Inhibitor

Aceto Chem. Co., Inc., Dept. MF, 40-40 Lawrence St., Flushing 54, N. Y.

"Pickle-Aid" is a 100% active powdered inhibitor which is completely water soluble. When added in small quantities to pickling baths, it is claimed to effectively inhibit attack by the acid on metallic surfaces, without retarding the removal of oxide scale or rust incrustation. Because it is a dry powder, savings on storage and shipping costs are effected, and it can be formulated with dry acids, such as sulfamic, bisulfate, etc. Recommended use proportions, data sheet and specifications can be had by contacting the manufacturer.

125/Circle on Readers' Service Card

Face Mask

Pulmosan Safety Equip. Corp., Dept. MF, 644 Pacific St., Brooklyn 17, N. Y.

No. 1750 full face mask is a light weight, low cost gas mask to provide protection to eyes, face and lungs. A single canister threads directly into the



facepiece. The mask is designed to eliminate build up of CO₂ in facepiece and to prevent fogging of lenses. Each canister is individually packaged in a moisture proof tube. The complete gas mask is packaged in individual fibre carrying and storage case.

127/Circle on Readers' Service Card

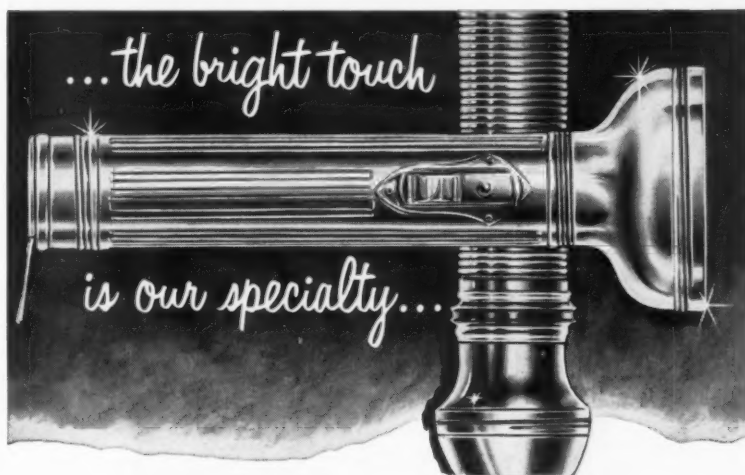
Temperature Controller

Electronic Processes Corp. of Cal., Dept. MF, 2190 Folsom St., San Francisco 10, Calif.

A new control unit, Electrotherm Model T-157, utilizes a resistance type sensing unit that permits the temperatures of industrial processes to be pre-

cisely controlled. These temperatures are correctly maintained through measuring the medium being heated, and modulating the power to the heater so that the average power input is equal to the heat loss. The device is cycled "off and on" in response to the slightest temperature changes, this sensitivity being responsible for immediate and accurate heat control.

The problem of overshooting the required temperature during initial warmup is nominal. As the temperature is rising, the proportioning action of the unit will continually reduce power input to the heater until the set temperature is reached. The power unit input will then equal the heat loss and



PACKER-MATIC completely automatic polishing, buffing and deburring machines are engineered to meet the demands of modern mass production methods for speed, economy and efficiency in finishing operations.

Whether you handle long production runs, short odd lot jobs, or a mixture of both, PACKER-MATIC is the machine for you. Let Packer's engineers help you meet your finishing requirements for faster, low cost polishing, buffing and deburring with more uniform results. Send blueprints or sample parts and we will show you how to speed up production and cut costs with a PACKER-MATIC.

PACKER - M A T I C

THE PACKER MACHINE COMPANY • MERIDEN, CONN.

Pioneer Manufacturers of Automatic Polishing and Buffing Machines

126/Circle on Readers' Service Card

DAVIS-K . . . LEADER in electrolytic Precious Metals!



First! WITH ONE OPERATION Antique Gold Solution

An inexpensive, quality electroplate with excellent color consistency and remarkable ease of operation.

First Again! with ONE OPERATION Antique Silver Solution

A Rich French Gray Antique Finish That Improves Quality and Costs Less!

Now the luxurious Antique French gray finish can be achieved quickly and easily with the new Davis-K one operation antique silver solution. Like all products engineered by Davis-K, this solution is tested and proved to be uniform in performance, outstanding in economy and unsurpassed in results.

OTHER DAVIS-K PRODUCTS:

- **HARD GOLD SOLUTION** for Printed Circuits and Electronic Parts
- **POTASSIUM GOLD CYANIDE SALTS**
- **LUSTROUS WHITE RHODIUM SOLUTION**
- Variable-type Tank Rheostats, specially designed for precious metal plating.

ALL DAVIS-K GOLD PLATING SOLUTIONS ARE:

- Made in all colors
- Color constant
- Tarnish-resistant
- Brilliant in finish
- Bottled by Troy Weight
- Made from assayed US Treasury Gold only
- Ready for immediate use

We are fully equipped to reclaim old gold and rhodium solutions. No charge for small sample plating. Write Dept. MF-2 for details!

FREE
Consultative Service
Call on Davis-K
process engineers
for help with your
special plating prob-
lems and installa-
tions.



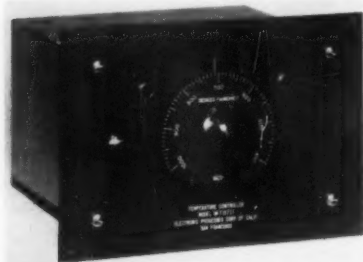
"Where Glittering Elegance Reflects Lasting Quality."

DAVIS-K
PRODUCTS, CO.
135 West 29th St., New York 1, N. Y.
Longacre 4-1978-9

128/Circle on Readers' Service Card

no overheating will have resulted.

This compact unit has a large calibrated dial permitting rapid and accurate temperature setting that can be observed visually from a considerable distance. A red light indicates the input



of power to the heater. The completion of the heating cycle can be immediately determined by the alternate flashing of a green and red light. Unitized plug-in construction assures ease of installation and permits rapid interchange of parts.

129/Circle on Readers' Service Card

Ultrasonic Cleaner

Alcar Instruments, Inc., Dept. MF,
17 Industrial Ave., Little Ferry, N. J.

A new, low cost 50 watt ultrasonic cleaner for small parts delivers 50 watts of power to crystal transducers mounted on the bottom of the stainless steel tank. Dimensions of the tank are 6" x 6" x 6" deep. It holds 2 quarts of



liquid. No cooling of the transducer is required. Optionally available is a 0-15 minute timer which shuts off the generator at a predetermined time.

Two cleaning tanks may be used alternately for different solutions or for a final, extra clean rinse. The unit, complete with one tank and all connecting cables, is priced at \$350.00.

130/Circle on Readers' Service Card

Hand Trucks

The Colson Corp., Dept. MF, Elyria, Ohio.

Among the many unique features of this all-purpose platform truck are conveniently removable handles which enable the truck to be converted to suit the specific handling needs of the user. To support bulky material, both handles are left in position. This stake-type truck can be either pushed or pulled. When one handle is removed, the truck becomes a push type, capable of carrying large packages which cannot fit the 16" x 30" deck limitations imposed when both handles are utilized. Its 16-gauge steel platform is completely encircled by a heavy-duty, non-marking rubber bumper to prevent scratching, scraping and marring of surfaces with which the truck comes in contact.

The Model 10-6241-65 platform truck is mounted on two swivel casters and two rigid casters for easy maneuverability. Rubber tired wheels make operation both smooth and noiseless. Load capacity is 800 pounds.

131/Circle on Readers' Service Card

Blast Cleaning Abrasive

Pangborn Corp., Dept. MF, Hagerstown, Md.

A new superior quality steel blast cleaning abrasive, with a narrow hardness range, extreme uniformity, density and toughness, Rotoblast steel shot will provide improved cleaning quality, faster cleaning speeds and lower production costs, it is claimed.

Available in all standard S.A.E. sizes, the new abrasive is shot by an exclusive vacuum cast method which pro-

vides greater density and eliminates the voids and defects encountered in conventional steel shot. It then goes through a continuous heat treat in a controlled atmosphere to produce a virtually scale-free shot of greater uniformity and a narrower range of hardness than is possible with conventional batch manufacturing techniques.

To complement rigid manufacturing controls, a comprehensive inspection and testing program is utilized to maintain uniform metallurgical and chemical properties of the abrasive.

For easier handling at the blast cleaning equipment the abrasive is shipped in 50 lb. double burlap bags. A nonreturnable pallet holding forty 50 lb. bags can also be furnished.

132/Circle on Readers' Service Card

Ultrasonic Cleaners

Narda Ultrasonics Corp., Dept. MF, 160 Herricks Road, Mineola, N. Y.

The SonBlaster ultrasonic generator Model G-601 and related transducers in this low cost, mass-produced series compare in quality, capacity, power, performance and appearance with ultrasonic equipment selling for two to three times as much. By virtue of the economies afforded by mass-production techniques, prices for complete systems begin at only \$345, the lowest cost ultrasonic equipment ever offered to American industry.

The Series 600 line comprises thirteen different ultrasonic systems made up of various combinations of the generator and ultrasonic transducer models NT-601 to NT-609. The stainless steel transducerized tanks in this series range from 1/2 gallon to one gallon capacity with single or double tank compartments. Some feature inlet and outlet taps for hook-up with external recirculating systems; others feature self-contained recirculating pumps, filters

The Leading Name in Immersion Heating

There's a **Glo-QUARTZ*** IMMERSION HEATER for YOUR EVERY HEATING REQUIREMENT

All 3 Types

- INSTANT HEATING
- SHORT-PROOF
- AVAILABLE IN ALL VOLTAGES—WATTAGES, one and three phase
- STOCKED FOR IMMEDIATE SHIPMENT

TYPE "U"

PATENT PENDING
World's first successful U-tube

ACID Heater

— Guaranteed to outperform and outlast all other quartz heaters.

TYPE "GN"

Pat. No. 2,740,881
Standard straight tube Quartz

ACID Heater

— Vapor-proof junction box; replaceable heating element.

TYPE "MB"

"Multi-Blade", Metal-sheathed
ALKALI Heater
— Portable, burn-out proof, easy mounting, long life.

If you're looking for

ACCURACY—EFFICIENCY—LONG LIFE—and ECONOMY
...you'll get it with **Glo-QUARTZ!**

Available from your *Electroplating Distributor!*



Glo-QUARTZ ELECTRIC HEATER CO., INC.
*Trademark Reg. U.S. Pat. Off. **WILLOUGHBY, OHIO** Phone: Willoughby 2-5521

133/Circle on Readers' Service Card

and temperature controls. Submersible transducer models NT-604 and NT-

605 are hermetically sealed in leak-proof heliarc-welded stainless steel cases for use in installed tanks.

134/Circle on Readers' Service Card



METAL FINISHING, May, 1958

Extension Shaft Fans

Propellair Division, Robbins & Myers, Inc., Dept. MF, Springfield, Ohio.

A new line of axial flow extension shaft fans is designed for exhausting contaminated fumes from hoods or tanks, spray booth exhaust, oven recirculation and other installations requiring isolation of the fan motor from the air stream. For corrosive exhaust, special corrosion resistant coatings for

129

the fan and the extension tube are factory applied when specified.

Designated as "Type CE," the new fans are non-overloading and, thus, are suitable for use over a wide operating range from free air to 1½ inches static pressure.

Propellers, available in various multi-blade designs, are modern airfoil type made of cast aluminum-magnesium alloy and are carefully balanced for peak efficiency.

Drive shaft and bearing assemblies are oversized for long life. Bearings are sealed (but lubricable if desired) and prelubricated with high temperature silicone grease. Heavy duty flexible couplings are used. These couplings require no lubrication since the load is entirely transmitted by compression of a flexible cushion, thus eliminating wear.

Available in nine diameters to sixty inches, the new fans have certified air deliveries to 79,000 cubic feet per minute. A wide selection of extension shaft lengths ranging from 16 to 66 inches is available.

135/Circle on Readers' Service Card

Solenoid Valves

J. D. Gould Co., Dept. MF, 4707 Massachusetts Ave., Indianapolis 18, Ind.

Included as standard equipment in a new low-cost line of quality solenoid valves are many features that are available in other valves only at extra cost. Among these are molded epoxy resin



waterproof coils, unbreakable piston rings and guided pilot valve seats.

Known as Type M, the line consists of general service valves in nine sizes from ¾" to 3" — priced as low as \$13.25 to the user. The valves are packless, 2-way piston pilot operated and are designed for pressures to 400 psi and temperatures to 340°F.

136/Circle on Readers' Service Card

Floor Resurfacer

Tropical Paint Co., Dept. MF, Cleveland 2, Ohio.

Dust-free skid-proof, resilient re-surfacing of old concrete and wooden floors is now possible with Lifekote Bond and Unicrete, two new products. Producing a new, black, durable surface, usable in 12 hours, their resiliency provides more comfortable standing and walking, and withstands the impact of continuous heavy trucking without chipping or crumbling.

Its dustproof feature eliminates physical aggravation and discomfort, protects machines and parts. It is noiseless, skid-proof, odorless and fire-resistant, and gives years of service under normal plant conditions.

"PRE-CLEANING
PAYS OFF!"



I RECOMMEND USING A PRE-CLEANER, DAVE. TRY RUNNING YOUR PARTS THROUGH PENNSALT CLEANER MC-1® BEFORE ETCHING. IT'S GREAT FOR SETTING UP THE SURFACE SO THAT IT'S CLEAN OF SOIL, OIL AND UNEVEN OXIDE.



WE'RE GETTING A PRETTY UNEVEN ETCH ON OUR ALUMINUM STRUCTURAL PIECES, DAVE. THE SALES DEPARTMENT IS HOWLING BECAUSE OF THE FINISH WE'RE GIVING THEM.



THAT MEANS AN EXTRA OPERATION, JIM.



BUT IT WON'T ADD TO COST. PENNSALT CLEANER MC-1 GIVES A LIGHT ETCH ITSELF. YOU CUT TIME IN THE ETCH BATH. AND YOU USE LESS ETCHANT, BECAUSE IT DOESN'T HAVE TO REMOVE SOIL.

Application is simple. The cleaned floor is coated with Lifekote Bond, followed by a half-inch thickness of Unicrete. Levelling and smoothing are simple and easy. Maximum smoothness can be obtained by trowelling after four or five hours. The floor is ready for foot traffic and light trucking in 12 hours.

137/Circle on Readers' Service Card

Work Gloves

Industrial Glove Div., Riegel Textile Corp., Dept. MF, Conover, N. C.

Thousands of tiny non-skid plastic dots embedded in a new fabric are the secret behind the "Mighty-Grip" work glove, a tough, feather-light industrial glove that provides outstanding safety grip without sweating hands or tiring fingers. The new glove is said to outlast and outgrip other long-wearing gloves, and costs considerably less than other gloves designed for the same work.

Every square inch of the glove contains 300 tough little dots, permanently molded right into the cloth. The dots are made of a special plastic that grips

smooth surfaces, bulky objects and small, odd-shaped parts with equal ease.

The new glove is extremely comfortable because the fabric is light in weight and flexible for true "dress-glove" comfort. And because the fabric breathes between the dots, it per-



mits rapid evaporation of perspiration.

138/Circle on Readers' Service Card

Corrosion Resistant Coatings

Gates Engineering Co., Dept. MF, Wilmington, Del.

The above manufacturer announces three additional new products to their extensive line of protective coatings, a hot spray vinyl, a Hypalon liquid coating, and a new formulation of their neoprene maintenance coating.

The hot spray vinyl is a high solids coating that allows deposit of a heavy quick-drying film with little overspray and excellent edge build-up resistance to sagging. The bright-colored Hypalon coatings, claim the manufacturer, resist strong oxidizing agents and acids, show unusually good flex-life, and will not alligator or crack after application and prolonged exposure. The manufacturer further states that their neoprene maintenance coating can be hot sprayed, and that brushability, color stability and wrinkling associated with recoating have been greatly improved.

139/Circle on Readers' Service Card

WELL HERE'S A MAN WHO MIGHT HELP US . . . JIM CARLIN FROM PENNSALT. HE HELPED US SET UP OUR ETCHING SYSTEM.

I NOTICED ON MY WAY THROUGH THE SHOP THAT YOU'VE SWITCHED TO A HEAVIER GRADE OF OIL FOR DRAWING. THAT'S PROBABLY WHAT'S CAUSING THE TROUBLE. SOMETIMES, ALUMINUM HAS TO BE PRE-CLEANED OR YOU'LL GET AN UNEVEN ETCH.

WHAT WOULD YOU RECOMMEND, JIM?

LATER THAT MONTH...

HOW'S THAT FOR A SMOOTH SATIN ETCH, JIM? COMPETITION WILL HAVE TO GO SOME TO MATCH THAT.

SMOOTH AS A KITTEN'S EAR, DAVE. PENNSALT CLEANER MC-1 SURELY HELPS YOU GET A BETTER JOB OF ETCHING WITHOUT INCREASING ETCH TIME OR COST.

Whenever metal surface preparation gives you rough problems, call your Pennsalt salesman. He can help you to "A BETTER START FOR YOUR FINISH"

METAL PROCESSING
DEPARTMENT 641
PENNSALT CHEMICALS CORP.
3 Penn Center, Philadelphia 2, Pa.



A better start for your finish

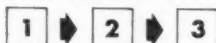
**ED. WHITE, KLEM TECHNICAL DIRECTOR,
DISCUSSES ANOTHER KLEM PRODUCT**

"Eliminate heating costs—clean and phosphatize at room temperature with KLEM-KOTE"



Three or five stage systems are equally adaptable to this phenomenal new method of cleaning and iron phosphating.

IN THREE STAGE SPRAY WASHER



1 — KLEM-KOTE (2 oz. per gal) 2 — Water Rinse
3 — KLEM TaCoMite (Cromic Acid Rinse)

IN FIVE STAGE SPRAY WASHER



1 — KLEM CLEANER #258 (2 oz. per gal) 2 — Water Rinse
3 — KLEM-KOTE (2 oz. per gal) 4 — Water Rinse
5 — KLEM TaCoMite (Cromic Acid Rinse)

Some of the principal benefits are: Heat Savings, Lower Maintenance Costs, Paint Adhesion equivalent to the highest priced phosphate treatments. Find out for yourself how cool KLEM-KOTE can effect savings in your plant.

WRITE FOR OUR TECHNICAL BULLETIN

**KLEM
CHEMICALS, INC.**

14401 Lanson Avenue
Dearborn, Michigan

141/Circle on Readers' Service Card

Insertable Union Check Valve

Jordan Industrial Sales Div., OPW Corp., Dept. MF, 6013 Wiehe Road, Cincinnati 13, Ohio.

No. 15 insertable union check valve has body of 101 grade nylon, which prevents line flow of liquid in one direction while allowing free flow in opposite direction, with low pressure drop. It installs easily in existing piping. Resilient nylon fins seat tightly despite unevenness or angle differences of union faces. It acts as a gasket between faces of the union, and is available in 1½" size. Model 15-S has 40-mesh brass screen strainer.

142/Circle on Readers' Service Card

Graphite Heat Exchanger Tube

National Carbon Co., Dept. MF, 30 E. 42nd St., New York 17, N. Y.

A new impervious graphite tube has internal low fins that more than doubles the inner surface area of Karbate impervious graphite shell and tube heat exchangers. Twenty-three fins, each ⅜-inch high, increase the inner surface to 2.6 times that of a plain ⅞-inch ID tube. The fins twist helically through the length of the tube, providing turbulent flow at right angles to their longitudinal axis, thus accentuating the difference between streamline and turbulent flow, and increasing the heat



transfer coefficient as fluid velocities increase.

The new low-fin tube has outer dimensions identical to ⅞-inch ID, 1¼-inch OD plain impervious graphite tubes, making possible replacement of plain tubes in existing impervious graphite heat exchangers to provide greater capacity in the installation without changing flow plan, piping, or support structure. The new tube is available in 6, 9, 12, 14, and 16-foot lengths.

143/Circle on Readers' Service Card

Abrasion Testing Instrument

Keystone Electric Co., Inc., Dept. MF, 1220-1230 Ridgely St., Baltimore 30, Md.



The PEI Abrasion Tester, developed by the Porcelain Enamel Institute in conjunction with the National Bureau of Standards to provide a simple but accurate means of testing and comparing the abrasion resistance of all types of porcelain enamel finishes, is now in production and available for both research and control purposes in other industries such as paints and varnishes.

The tester consists of a synchronous motor-driven table which gyrates horizontally at a frequency of 300 cycles per minute, so that every point on the table describes a ⅞ inch diameter circle. Specimens and abrasive charges are clamped in any or all of the nine water-tight holders, and the tester is

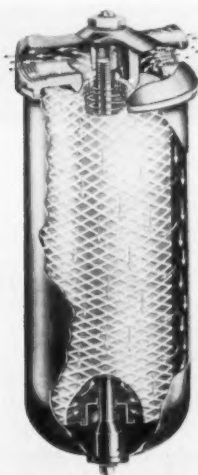
set to operate through the desired cycle, which is accurately controlled by a counter-timer.

144/Circle on Readers' Service Card

Stainless Steel Filter

Commercial Filters Corp., Dept. MF,
2 Main St., Melrose, Mass.

Made with a one-piece drawn shell of #316 stainless steel, this new SSB10 Fulflo Filter resists chemical attack and



oxidation. It provides micro-clarity of liquids and gases at operating pressures up to 150 psi. Flow rate is 2½-5 gpm for liquids of aqueous viscosity. Two pipe sizes—¾ and ¾ inch. Air vent and drain plug are included.

145/Circle on Readers' Service Card

Self-Closing Drum Faucet

Protectoseal Co., Dept. MF, 1920 So.
Western Ave., Chicago 8, Ill.

A sturdy spring located within the body of this newly improved safety drum faucet maintains a liquid-tight closure at all times. Hand pressure on the large level-type handle is necessary to push spring back and permit flow of liquid. No seepage or leakage is possible when hand pressure is re-

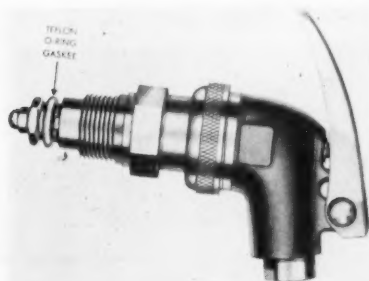


Photo courtesy Hanson-VanWinkle-Munning Co.

with MANHATTAN RUBBER LINING

How can you be sure your costly pickling and plating equipment is *permanently* protected against corrosive solutions . . . the *solutions* protected against contamination? Manhattan rubber lining engineers have the answer. Thick, multiple calendered sheets of natural or synthetic rubber are bonded to the tank metal so securely they can't be separated! Manhattan *bonded protection* has kept many tanks in continuous use over 30 years!

Manhattan Rubber Linings eliminate the dangers of stray currents in plating operations. They expand and contract

with metal, won't harden, crack or pickle — even under extreme temperature changes. Every Manhattan rubber lined tank is tested under high voltage to detect any imperfection before it is shipped to your plant.

Be *certain* of lifetime protection for your costly equipment and be protected against contamination of expensive plating baths. Specify Manhattan Lining on your next equipment or let Manhattan handle your next tank lining job. Contact the Manhattan rubber lining facilities nearest your plant.

RM-637

RUBBER LINING PLANTS AT PASSAIC, N. J. • NORTH CHARLESTON, S. C.



MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Manufacturers of Mechanical Rubber Products • Rubber Covered Equipment • Radiator Hose Fan Belts • Brake Linings & Blocks • Clutch Facings • Packings • Asbestos Textiles Engineered Plastic, and Sintered Metal Products • Abrasive & Diamond Wheels • Bowling Balls

146/Circle on Readers' Service Card

moved, as the valve closes automatically.

A new type Kel-F or Teflon, O-ring gasket is now being used to withstand the destructive action of chemicals which deteriorate synthetic rubber gaskets. The O-ring construction uses a positive wedging seat action which forms a tight seal and avoids any gasket leakage due to swelling, shrinking, cracking or other deterioration common to synthetic rubber gaskets.

Two types are available: (1) a self-positioning swivel-type faucet which may be screwed tightly into the drum opening and the spout portion, regardless of position, then swiveled to the

correct angle for dispensing where it is secured by a knurled locking ring; and (2) the usual rigid type faucet which generally requires a thread compound to form a liquid-tight connection. Body of the faucet may be of non-sparking brass or stainless steel; lever-type push handle is a cadmium plated steel stamping. A cylindrical perforated brass fire baffle, which also serves as a strainer, is located within the faucet at the dispensing end where it is easily removed for cleaning without unscrewing the faucet. Provision is made for padlocking both faucets in a closed position to prevent unauthorized withdrawal.

147/Circle on Readers' Service Card

BUSINESS ITEMS

Michigan Chrome and Chemical Co. Announces Appointments

Michigan Chrome and Chemical Co., Detroit, Mich., announces the appointments of *Hans Neumann* as a research supervisor on the staff, and *Arthur C. Lansing* as manager of the laboratory of the Chemical Division of the company.

Neumann is a graduate of Leipzig University, with a degree in organic chemistry, and has been engaged in chemical research activities all of his life in industry. He managed a chemical factory in Germany and has been in the United States for eighteen years. He became interested in plastic coatings through his work with the Aviation Research Institute in rocket fuels. Developing materials and techniques for the protection of metals led to coating with available and experimental

synthetic materials. Neumann has a number of patents to his credit.

Lansing is a graduate of Cornell University and took graduate work there and at the Colorado School of Mines. His background includes many years' experience in the engineering, production, evaluation, research, and control phases of the chemical industry. In recent years, Lansing has been a consultant in fields relating to chemistry and chemical engineering.

Cowles Appoints Two District Managers

George E. Parisho has been appointed district manager of the mid-western territory comprising the States of Missouri, Iowa, Illinois, Wisconsin and Minnesota, and *Elmer A. Lord* has been appointed district manager of the Eastern Pennsylvania and Northern Ohio territory by *Cowles Chemical Co.*, Cleveland, Ohio.

Parisho has been sales and service representative since he first came with the firm five years ago. He is not only an expert on metal cleaning and finish-



George E. Parisho

ing, but on phosphate coatings as well. He makes his home in Davenport (Bettendorf), Iowa.

Lord came with the company in 1948 shortly after he graduated from Western Reserve University. His first few years were spent in the sales promotion department, then he was trans-

COATINGS for Zinc and Cadmium

KER-CHRO-MITE® #4

Gives a mirror-like finish to dull-plated work; protects against corrosion, is stain resistant and outperforms other coatings.

KER-CHRO-MITE AL

Produces a yellow chromate conversion coating on pure aluminum or on high silica alloys. Excellent as a base for paint or as a final high resistance finish.

ZIN-K-LUX® (Zinc Brightener)

Produces a lustrous finish (barrel or still) and has excellent throwing power.

CADLUX (Cadmium Brightener)

Brightens (barrel or still), increases plating range and eliminates burning.

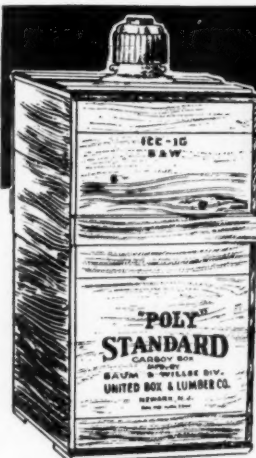
® Registered Trade Mark.

KOSMOS

ELECTRO-FINISHING RESEARCH, INC.

140 LIBERTY ST. Ph.: HUBbard 7-8889 HACKENSACK, N. J.

*
N
O
W
P
A
C
K
E
D
I
N
P
O
L
Y
E
T
H
Y
L
E
N
E
C
A
R
B
O
Y
S



new
6½ and 13-Gal. **"POLY" STANDARD PLASTIC bottle**

Encased in **POLY-STANDARD**

CARBOY BOX

I. C. C. - 1G approved. Durable. Lightweight.

Inquiries cordially invited

BAUM & WILLSE Division

UNITED BOX & LUMBER CO.

45 Wheeler Point Road
NEWARK 5, N. J.

MArket 2-4500

148/Circle on Readers' Service Card

149/Circle on Readers' Service Card



Elmer A. Lord

ferred to heavy chemical sales and three years ago was appointed to the metal finishing chemicals department. He makes his home in Cleveland (Wil-
lowick), Ohio.

Raybestos-Manhattan Sales Changes

Raybestos-Manhattan, Inc., Passaic, N. J. announces changes in its Northeast sales district. *Stewart Monroe* formerly Northeast district manager, has been appointed special representative—national accounts, a new position he is exceptionally qualified for. *John McKinlay* has been appointed manager of the district. McKinlay was previously assistant sales manager Packing Division.

DeVilbiss Opens New Eastern Sales Branch

The *DeVilbiss Co.* has completed transfer of the northeastern headquarters from Newark to a new building in Springfield, N. J. The new branch, with more than 11,000 square feet of floor space, includes a testing and demonstration area, repair, rebuilding and exchange center and sales, engineer-



Electratilt Model With Polygonal Barrel



Hydratilt Model

the new

BAIRD

POLI ACTION

barrel finishing machines

designed for today's production line requirements

This new line of machines, available in two basic sizes, has been designed to meet an increasing demand for equipment of production line quality that can be economically adapted to a wide range of barrel finishing requirements.

Exceptionally "clean-limbed" in design, with all working parts and electrical equipment efficiently protected, these machines are at the same time compact, easy to keep clean, and easy to service. Modern finger-tip control and well-engineered drive and tilting mechanisms result in unusually smooth, fast and convenient operation that can mean important time and labor savings as well as close-limit control of product quality.

Equipment can be adapted readily to a wide range of barrel types, finishing methods and production needs.

Baird is one of the oldest and largest makers of barrel finishing equipment for production line service. Our long experience suggests that, when installing new equipment of this type, you first...

ask BAIRD about it.

With these important new features...

- "Clean-limbed" for easy housekeeping • Time-saving finger-tip control • Electratilt power tilting or Hydratilt manual-hydraulic • Vari-sheave or vari-speed motor drive • Easy accessibility for adjustment or service



THE BAIRD MACHINE COMPANY • STRATFORD, CONN.

Write Department MF

150/Circle on Readers' Service Card

ing and administrative offices for *DeVilbiss* and its newly acquired subsidiary, *Newcomb-Detroit Co.*, (now called

Newcomb-DeVilbiss Co.) designers, manufacturers and installers of custom-built industrial finishing equipment.

The new location, at 10 Stern Ave., is just off U. S. Route 22 and adjacent to the Garden State Parkway for easy customer access. Ample parking space is available. *C. B. Gracely*, Northeastern regional sales manager, is in charge.

The company has also moved its Milwaukee sales office from 833 E. Kilbourne Ave. to 6915 W. Capitol Dr. *E. B. Brown* and *W. S. Crozman* are the company's Milwaukee representatives.





FREE 24-page BOOK on Ultrasonic Cleaning

packed with up-to-the-minute
information on

**Systems Design
Equipment
Materials Handling
Chemicals
Techniques**

for fast, thorough, economical
cleaning in every industry.

Learn how to create and use
cavitation

in cleaning fluids — the myriad
tiny implosions shown enlarged
in the background of this ad.
Learn how cavitation literally
blasts soils loose in seconds,
making critical parts micro-
scopically clean.

BRANSON ULTRASONIC CORPORATION
STAMFORD • CONNECTICUT

To: **BRANSON ULTRASONIC CORP.**
21 Brown House Rd., Stamford, Conn.

Mail your new 24-page book on
Ultrasonic Cleaning to:

Name _____

Dept. _____ Title _____

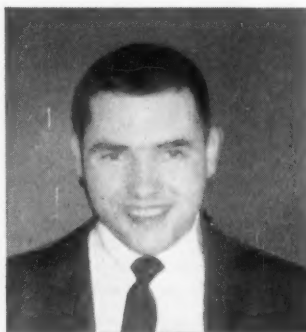
Firm _____

Address _____

I want to clean _____

Sales Engr. to call? Yes ☐ No ☐

American Buff Adds Ramseier To Staff



Rene Ramseyer

The appointment of *Rene Ramseyer* as design engineer for new products and project installations, is announced by American Buff Co. Mr. Ramseyer will work on special buff problems and applications, service projects and factory liaison. Born and educated in Switzerland, (B.S. in Mechanical Engineering) Rene speaks French, German, and English. His design engineering for Louis de Roll Iron Works in Gerlafingen, Switzerland preceded similar work with U. S. Engineering and Mfg. Co., Chicago. His army service, as well, was on both sides of the Atlantic: in the Swiss Army Infantry, the U. S. Army Corps of Engineers and the U. S. Army Infantry. Although Mr. Ramseyer will make his headquarters at the firm's Chicago plant, he will work

closely with all of the company's field sales engineers throughout the country.

Marc Darrin Retires

Marc Darrin, former associate director of research for the *Mutual Chemical Co. of America*, has retired after a distinguished career of over forty years in the chemical industry. Author of more than 100 published articles on a wide variety of chemical subjects, he also holds over 50 U. S. and foreign patents.

Mr. Darrin received a Bachelor of Science degree in Chemistry and Masters degree in Chemical Engineering from the University of Washington. He joined the University's faculty in 1913 as an assistant instructor and the following year accepted a position as chemist with the U. S. Forest Service. In 1921, Mr. Darrin was named a senior industrial fellow by the Mellon Institute, a post he held for 17 years. He joined Mutual as chief chemist in 1936 and was named associate director of research in 1949.

Mr. Darrin has been chairman of various committees of The American Society for Testing Materials. He is also a past president of The American Institute of Chemists.

E. F. Houghton & Co. Opens New Detroit Plant

Completion of new plant and laboratory facilities which will greatly expand its manufacturing potential for the De-

BUFFS FOR INSIDE POLISHING



GOBLET BUFFS, TAPER BUFFS, CYLINDER BUFFS, SMALL POLISHING WHEELS, RAZOR EDGE BUFFS, and many others for deburring, polishing and grinding any internal contour.

Write for additional information or contact your local dealer. These buffs are stocked by many dealers throughout the country.

We manufacture a COMPLETE LINE OF BUFFS including full disc loose and sewed buffs and polishing wheels. Our metal center BIAS TYPE BUFF may help cut your polishing costs.

Your request on your letterhead will bring our complete catalog by return mail.

BARKER BROTHERS INC.

ESTABLISHED 1911

1660 Summerfield Street

Brooklyn 27, N. Y.

Canadian Distributor — LEA PRODUCTS COMPANY, Montreal

151/Circle on Readers' Service Card

152/Circle on Readers' Service Card

troit market, speed up local deliveries and reduce delivered prices is announced by *E. F. Houghton & Co.*

The plant is located at Lumpkin Ave. and Detroit Terminal Railroad and is served by a freight siding and motor truck lines, assuring prompt deliveries. Twenty-four-hour delivery on standard volume products in the Detroit area is the objective.

New facilities include horizontal and vertical compounding and mixing, stainless steel tanks for chemical processing, and modern control and testing facilities. Special fork truck hand-

ling of pallets to a 13-foot height to the compounding floor has been planned.

The Detroit Sales Division is headed by sales manager *Harry E. Martin*, with downtown offices in the Stephenson Building.

Sharpe Appointed Distributor for "Therm-O-Spray" Paint Heater

Sharpe Mfg. Co., manufacturers of spray equipment, has recently been appointed western distributor for Therm-O-Spray paint heaters. The distributor is located at 1224 Wall St., Los Angeles 15, Calif.

New Quarters For Scientific Control Labs., Inc.



Scientific Control Laboratories, Inc., announces the completion of their new laboratory building at 3136 So. Kolin Ave., Chicago 23, Ill., as another step in their twenty years of progress. In addition to new quarters, new equip-

ment and new personnel have been added.

Still further expansion of facilities for research, consulting, design, layout, trouble-shooting, and routine quality controls are planned.



NEW! VERSATILE!

A-F Cleaning, Phosphate Coating and Drying Machine

For most effective power spray coverage and draining — to meet the varying cleaning requirements of different types of stampings — both an A-F Overhead Conveyor and an A-F Flat Wire Mesh Belt Conveyor pass through this machine.

This new A-F "Siamese Twin" Cleaning, Phosphate Coating and Drying Machine is only one example of A-F creative engineering in the field of cleaning and finishing metal parts and products. Whatever your problem in this field, A-F can help you solve it!

Write today for FREE 28-page illustrated brochure.

A-F ENGINEERED Cleaning and Finishing Machines
Plant-Wide Conveying Systems
Pre-Engineered Conveyors—Rollers, Wheel, Belt, Trolley

THE ALVEY-FERGUSON CO., 501 Disney St., CINCINNATI 9, OHIO and Azusa, California

153/Circle on Readers' Service Card

50 TIMES LONGER
WEAR—with

WORKLON

Acid and Caustic Resistant INDUSTRIAL APPAREL

of DuPont ORLON
DuPont DACRON
Union Carbide DYNEL
LINT-FREE 100% ORLON



SAVINGS UP TO 93%

Worklon work clothes resist punishing acids and chemicals . . . actually outlast cotton and wool garments by 50 to 1 as proved in on-the-job tests under corrosive chemical conditions. No need for constant replacement of acid-damaged uniforms! Worklon apparel wears far longer, saves you as much as 93% in work clothes costs! Want proof? See Worklon's new 1958 catalog and information book. It's yours for the asking!

SEND FOR NEW FREE CATALOG

WORKLON, INC. Dept. MF-58 253 W. 28 St., N. Y., N. Y.

Gentlemen:

Please send me the new Worklon Catalog FREE!

NAME _____

ADDRESS _____

CITY _____

STATE _____

WORKLON

253 W. 28 St. N. Y. N. Y.

154/Circle on Readers' Service Card

United Wallpaper Appoints Anderson

Richard J. Anderson has been appointed head chemist, Trade Sales Laboratory, by *United Wallpaper, Inc.*, Chicago, manufacturer of protective coatings. Before assuming his present



Richard J. Anderson

position, Mr. Anderson had been administrative assistant to the technical director of the firm's central research laboratories. He came to the company with several years of research and development experience in the paint and resin industry.

Now 30 years of age, Mr. Anderson was graduated from the Illinois Institute of Technology with the degree of B.S. in Chemical Engineering.

Wildason Appointed Sales Manager for Hohman Plating & Mfg., Inc.

Hohman Plating & Mfg., Inc., Dayton, Ohio, has announced the appointment of *Karl A. Wildason* as sales manager. He will direct sales activities of the company's solid film lubricants and their production metal finishing service.

Mr. Wildason served for many years as the Dayton district sales manager for the DeVilbiss Co. of Toledo. Prior to joining Hohman he was co-founder and operator of the Dayton Re-New Tool Co. Mr. Wildason is a member



Karl A. Wildason

of the Dayton Engineers Club, The American Society of Tool Engineers and the Society of Military Engineers.

Infilco Appoints Hutchinson

Thomas P. Hutchinson has been appointed representative of *Infilco (Canada) Ltd.* in Eastern Ontario, Quebec



- RECTIFIERS AND CONTROLS
- SELENIUM — GERMANIUM
- AUTOMATION SYSTEMS
- CONSTANT VOLTAGE UNITS
- VOLTAGE REGULATORS Manual or Automatic
- TIMING AND PROGRAMMING

Send for complete information.

MACARR, inc.

2543 BOSTON ROAD
New York 67, N. Y.
OLinville 3-3306

155/Circle on Readers' Service Card



"A Flexible and Resilient Buff for Flat or Irregular Surfaces"

FORMAX ZIP-TIP BUFFS

The radial segment construction of the Zip-Tip Buff permits it to perform equally well on flat or contoured surfaces. The cross-cutting movement of the spoke-shaped segments prevent work streaking while it breaks up straight-line patterns on the surface.

- Zip-Tips are available in a wide variety of all cloth constructions —also combinations of cloth and sisal.
- Zip-Tips are made of heavy-duty, bias-cut materials mounted on ventilated steel centers.
- Zip-Tips are extra thick and provide wider buff faces with greater compound retention capacity.
- Zip-Tips are perfectly balanced —require no raking.

Write for Descriptive Literature

FORMAX MFG. CORP.

DETROIT 7, MICHIGAN

"THE FOUR MCALEERS"

156/Circle on Readers' Service Card



Thomas P. Hutchinson

and the Maritime Provinces. He will have his headquarters in Montreal.

Born in Winnipeg, Mr. Hutchinson, a registered professional engineer, has been active in the industrial consultant and construction fields in Ontario and Quebec since 1945, and has been associated with several large Canadian firms on major projects.

He is a McGill graduate, a former officer of the Royal Canadian Engineers, and a member of the Engineering Institute of Canada and of the Technical Section of the Canadian Pulp and Paper Institute.

Wilson Joins Stokes of Canada

Roy Wilson has joined the staff of F. J. Stokes Co. of Canada, Ltd., subsidiary of F. J. Stokes Corp., Philadelphia, as a sales engineer. He will work out of the Toronto headquarters, which are located at 4198 Dundas St. West.

Mr. Wilson, a native of Toronto, graduated from the University of Toronto in 1953, with a Bachelor of Applied Science degree. Before joining Stokes, he had been a design engineer for Purolator Products (Canada), Ltd., and prior to that he was an industrial engineer for Gair Company (Canada), Ltd.

Mr. Wilson is a member of the Toronto Junior Chamber of Commerce and is president of Cinquem Fraternity, a local community club, which he helped to organize.

Petrocelli Named Head of Electrochemical Section at Inco Bayonne Lab.

Dr. Joseph V. Petrocelli has been appointed head of the Electrochemical Section of the International Nickel Co.'s research laboratory at Bayonne,



Dr. Joseph V. Petrocelli

TAKE THE **LOAD**
OFF YOUR **TOP**
BRASS



USE **TRUE BRITE**
BRASS SOLUTIONS

Trouble Free — Low Cost
Little Supervision Needed
Ready To Use — Just Add Water
Uniform Color — Can Match Colors

Write For Bulletin on Brass Plating

TRUE BRITE CHEMICAL PRODUCTS CO.
BOX 31, OAKVILLE, CONN.

157/Circle on Readers' Service Card

Non-Breakable • Sturdy **Polyethylene Containers...**

TANKS ARE MOLDED IN ONE PIECE — WITHOUT SEAMS AND WITH INNER FLANGES FOR SUPPORT

PPI Containers will withstand most acids and alkalis at temperatures up to 160°F.

Tank Sizes and Prices

Stock No.	5-PT	15-PT	30-PT	55-PT
Capacity (gals.)	5	15	30	55
Height	13 1/4"	20 1/4"	27"	32 1/4"
Outside Dia.	11"	14 1/4"	18"	22 1/4"
Wall Thick.				
Price Each	\$7.50	\$14.50	\$21.75	\$24.00



Cover Sizes and Prices

Stock No.	5-PTC	15-PTC	30-PTC	55-PTC
Size (gals.)	5	15	30	55
Price Each	\$2.50	\$4.00	\$4.50	\$6.00

LIGHTWEIGHT • LONG LASTING • NON-BREAKABLE

Polyethylene Pails - IN PASTEL COLORS

MOLDED IN ONE PIECE FROM NATURAL POLYETHYLENE... with GALVANIZED BAIL



Pail Sizes and Prices

Stock No.	11-PP	14-PP	17-PP
Capacity (qts.)	11	14	17
Height	10 1/2"	11"	11 1/2"
Diameter	10"	11"	12"
Price Each	\$3.00	\$3.50	\$4.00

Covers Available for 11 qt. Pails ONLY
Cover Price 80¢ Ea.

Stock No. 11-PPC

PLACE YOUR ORDER TODAY!

Dependable PPI Products...

• PLATING RACKS • RUBBER DRUM LINERS • ACID CONTAINERS • ANODE HOOKS • FIBERGLAS TANKS, DUCTS & HOODS • PLASTIC COATED DIPPERS & PAILS • STEEL TANKS • STAINLESS STEEL TANKS • LEAD LINED TANKS • PLASTIC LINED TANKS • POLYETHYLENE PAILS & CONTAINERS • FUME SEPARATORS • PLATE COILS • LEAD ANODES • TRICHLOROETHYLENE • PERCHLOROETHYLENE • SILVER BRIGHTENER.



PRODUCTS, Inc.

1509 N. WASHINGTON
KOKOMO, INDIANA

158/Circle on Readers' Service Card

N. J. Formerly director of research and development for The Patent Button Co., Waterbury, Conn., he joined the Bayonne laboratory staff on August 1, 1957, as a research electrochemist.

Dr. Petrocelli holds the degrees of Master of Arts and Bachelor of Arts from Wesleyan University, Middletown, Conn., where he majored in chemistry. While attending the graduate school, he majored in physical chemistry and minored in mathematics. Dr. Petrocelli obtained his Ph.D. in physical metallurgy from Yale, the subject of his thesis being Electrodeposition on Zinc Base Die Castings.

He has served as chairman of the Corrosion Division of The Electrochemical Society, Corrosion editor for the Journal of The Electrochemical Society for several years, and is a former president of the Waterbury Branch of the American Electroplaters' Society.

Krueger Joins American Chemical Paint Co.

American Chemical Paint Co., Am-



Edward R. Krueger

bler, Pa., announces the appointment of Edward R. Krueger as technical sales representative for their metal-working chemicals division. He will be attached to the Detroit, Mich. office and his area of activity will include Wisconsin, upper Michigan peninsula, and northern Illinois.

Frank Mesle Retires

The Rev. Frank C. Mesle, an ordained minister of the Reorganized Church of Christ of Latter Day Saints, retired recently from Oneida Ltd., after more than 60 years employment with the firm.

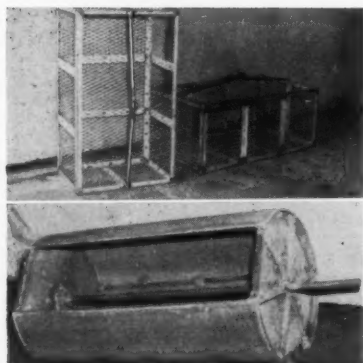
He was born in Buffalo and spent his boyhood in Niagara Falls. He began working for Oneida Ltd. at the age of 13 years and has remained with the company until now.

Mesle worked up to become foreman in the plating department, and later became plating consultant and industrial engineer. During World War II, he organized the Bearing Plating Department and became its superintendent.

He helped organize the Buffalo Branch of the American Electroplaters Society and served as the first secretary. Not only has he attended nearly every A. E. S. convention, but has contributed a number of papers, mostly on silver plating.

He served as editor of *The Monthly Review*, and was A.E.S. president in

Baskets Built for Your Job



**Strong
Efficient
Easy
Handling**

Baskets designed for your specific operating conditions — the right size and shape — the most suitable construction materials — and welded by Storts — will cut your material handling costs. Long service life — due to Stortswelding — reduces maintenance costs.

Also bins, boxes and tumbling barrels — Storts welds them all. Let us quote on your needs for special containers.



**38 Stone Street
MERIDEN, CONN.**

Manufacturers of Welded Fabrications to Specification

159/Circle on Readers' Service Card

LEA GRIPMASTER®

Industry's Abrasive

**BONDING CEMENT
for Wheels and Belts**

SIZES AS WELL AS BONDS

Gripmaster cuts out one preparation material and one preparation step. No special sizing is necessary. This superior bonding cement has a double use. But seein' is believin'. Test Gripmaster in your own plant under your own working conditions. Send us the enclosed coupon or use your company stationery and we'll send you a test size sample without charge or obligation.

LEA-MICHIGAN, INC.

14066 Stansbury Ave., Detroit 27, Michigan

(A member of the well-known Lea Group of Finishing Specialists)



Lea-Michigan, Inc.
14066 Stansbury Ave.
Detroit 27, Mich.

☐ Please send us your free sample of GRIPMASTER.
☐ Please send us literature giving full details.

Name _____ Title _____

Company _____

Address _____

MF-5-58

160/Circle on Readers' Service Card

1926, and a member of the society's research committee. Of interest is his chord method of measuring thickness of electroplated coatings and his "can opener" test for measuring bond strength. For these contributions he has received the Society's Founder's Gold Medal four different times, 1929, 1938, 1940 and 1943. He was elected to honorary membership by A.E.S. in 1952.

His religious activities have continued with his technical and industrial work. He served a small congregation of his denomination for eight years in Niagara Falls. He is still active in that capacity in this city. He also is active in the Sherrill Masonic and Eastern Star lodges.

Wilson Elected Vice President of Metals & Controls Corp.

John F. Wilson, general manager of marketing for *Metals & Controls Corp.*, Attleboro, Mass., has been elected vice president in charge of sales at a recent meeting of the Board of Directors. He joined the company in March 1957, previously having been general sales



John F. Wilson

manager of the Cleveland Welding Division of American Machine & Foundry Co. Prior to that was works manager of AMF's Leland Electric Division. Mr. Wilson has also held several positions at Sylvania Electric Products, Inc., in production, engineering and sales.

Originally from Salem, Mass., he has a B.S. in Mechanical Engineering from

the University of Maine and a master's degree in Business Administration from M. I. T., which he attended as an Alfred P. Sloan Fellow in 1940-41. During World War II he served two years on the War Production Board.

New Field Sales Engineer For NRC Equipment Corp.

William N. Kiely of Chicago, Ill., has been promoted to senior field sales engineer in the midwestern area for *NRC Equipment Corp.* He has been assigned to the larger office facilities recently acquired by the firm at 3555 W. Peterson Ave., Chicago 45, Ill.

Mr. Kiely joined the engineering staff of the company in 1955, following two years military service with the U. S. Army Chemical Corps. He was formerly a research and development engineer for the Barrett Division of Allied Chemical and Dye Corp., Philadelphia. Mr. Kiely attended school in Abington, Mass., and received his chemical engineering degree from Tufts College, Boston, in 1952. He is a member of Alpha Sigma Phi fraternity.

**This Exclusive
SURETY GLOVE
COMBINATION
SOLVES MORE
HAND PROTECTION
PROBLEMS**

than any other
we know



**SURESEAL
(HYCAR)
TURN-CUFF
INDUSTRIAL GLOVES**

Tests prove Sureseal's amazing long life—ten times and more wear than other materials. Since Surety makes gloves from all materials you may be sure of test impartiality. Adding Surety's famous safety feature, Turn-Cuffs, the barrier to dangerous liquids, provides the maximum hand safety and comfort to make willing hands and willing workers. Ask your jobber or write Dept. BW. The Surety Rubber Co., Carrollton, Ohio.



TEST

at our expense
Send for slide rule
showing gloves best
to resist chemicals,
acids, oils, solvents,
etc. Tell us your
glove need, too...
we'll send sample
pair.

In Canada: Safety Supply Co., Toronto

WE'RE NOT
Boasting—
just d--- enthusiastic
WHEN WE SAY THAT THE
GREAT RESPONSE
and DEMAND for
"Phosteen"
has been phenomenal

There must be a reason!—it's the big Economy in Equipment Investment Costs and Labor Saving in this Low-Cost Quality Method for

**CLEANING and PHOSPHATING
METAL SURFACES FOR PAINTING**

• What are you producing: Cabinets, Busses, Air Conditioners, Farm Implements, Caskets, Bulky Equipment, etc.—High or low production—Quality standards high? PHOSTEEM is adaptable to all of these requirements... (And, by the way, also approved by many paint companies.)

SEND TODAY FOR
PHOSTEEM BULLETIN 55-137

NEILSON CHEMICAL CO.

Southeastern Distributor:
F. H. BOSS CO.
Charlotte, North Carolina

2370 Gainsboro,
Detroit 20 (Ferndale), Michigan

Allentown, Penna.
Los Angeles, Cal.
Windsor, Ontario



161/Circle on Readers' Service Card

162/Circle on Readers' Service Card

Micro Deburring Co. Purchases Illinois Deburring Co.

Micro Deburring Co., Chicago, has announced the purchase of plant, equipment and all other assets of the Illinois Deburring Co., also of Chicago.

All facilities are being consolidated at Micro's plant at 5827 W. Lake St. Key personnel of Illinois Deburring are to be retained.

Tipp Mfg. Purchased by American MonoRail

American MonoRail Co. has added a low-cost overhead cable conveyor to its line of MonoRail products, with the purchase of the assets of Tipp Mfg. Co., Tipp City, Ohio.

Carl L. Sheets, with over 20 years of conveyor experience, has been appointed manager of the Conveyor Division. Joe Kohoot has been named assistant manager.

Ross Engineering to Build New Chicago Office

J. O. Ross Engineering Division, Midland-Ross Corp. has completed plans for construction of a new Chicago

office building to be located in suburban Mt. Prospect, Ill. The firm designs, fabricates and installs air process systems used in industrial heating, drying and curing operations.

The new 12,500 sq. ft. building, scheduled for completion in Sept. 1958, will house engineering and office personnel servicing the midwest area.

The new office will be headed by L. G. Janett, vice president and manager, Chicago office, and will service the territory bounded by Canada, the Gulf

of Mexico, the Rockies and the Middle Eastern States.

Cowles Appoints Wagner Bros.

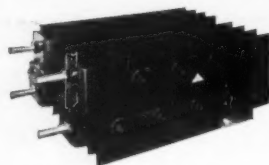
Cowles Chemical Co., Cleveland, Ohio, has appointed Wagner Bros., Inc., Detroit, Mich., distributors for their complete line of metal finishing chemicals. Stocks will be carried by Wagner at their various warehouse points and Cowles sales and technical service personnel will work closely with the local representatives of Wagner.



For the Finest in
PLATING
RECTIFIERS

A BETTER SOURCE OF DC POWER —
MORE FOR YOUR MONEY

- ★ Operate from —40° to 225° F.
 - ★ 50 to 50,000 Amperes DC
 - ★ Built-in Voltage Regulator and Meters
 - ★ Heavy Duty Transformers, Husky Fans
- Two styles available—1. Selenium for cool zones, or 2. Magnesium copper sulphide for the hot, dirty jobs. Units still running after 4 years of constant duty.



Replacement Rectifier Stacks
for Lektron or Udylite-Mallory

Magnesium copper sulphide rectifiers make your plating power supply more rugged and dependable. Magnesium radiator fins for fast heat dissipation and lighter weight. Matching pairs.



Model 4045—750 amps at 12 volts DC—1500 amps. at 6 volts D.C. Operates on 208, 220 or 440 A.C. Weight 525 lbs. F.O.B. Indianapolis, Indiana.

SOME JOBBERS AND SALES TERRITORIES OPEN

ELECTRONIC RECTIFIERS, INC.

2102 SPANN AVENUE

INDIANAPOLIS 3, INDIANA

163/Circle on Readers' Service Card

NEW, FREE BULLETIN

tells how to cut your
pumping costs

Describes new Ampco elastomer- and rubber-lined pumps that (a) cut the cost of handling plating solutions—even those containing HCl; (b) are self-insulating; (c) eliminate dangerously fragile or more expensive alloys; (d) are available from stock—in eight sizes—through your Ampco Pump Distributor.

Write for Bulletin P-6 today!

AMPCO METAL, INC.



DEPT. MF-5, MILWAUKEE 46, WISCONSIN

WEST COAST PLANT: BURBANK, CALIFORNIA

SOUTHWEST PLANT: GARLAND (DALLAS COUNTY), TEXAS

P-42

164/Circle on Readers' Service Card

Penetone Co. Appoints Klein Technical Service Manager

Penetone Co. of Tenafly, N. J., has announced the appointment of *Sidney Klein* as technical services manager. In this capacity, Mr. Klein will be responsible for assisting the firm's nationwide sales staff on technical matters concerned with the use and application of its line of industrial detergents, degreasing compounds, strippers, corrosion removal and preventive treatments and other chemical specialties. In addition, he will act as special representative for the company on technical matters with all government agencies.

Mr. Klein brings to the company twelve years of industrial experience in the industrial, marine, automotive and aircraft fields. A graduate of New York University, he formerly served as project engineer in charge of chemical operations at the Wright Aeronautical Division, Wood-Ridge, N. J. Later he was a sales engineer with the Chemclean Products Corp. of New York.

Mr. Klein is active in many technical societies including the New York Rubber Group and the American Electro-

platers' Society and has served on several government industry committees.

Electroforms, Inc. to Move

Electroforms, Inc., one of the country's foremost producers of electroformed aircraft, missile, industrial and environmental test parts, will soon move into their new facility, now nearing completion. Located at 239 East

165th St., Gardena, Calif., this new 20,000 square foot plant will enable the firm to meet the constantly increasing demand for their products and services.

At the present time, the company is able to produce parts as large as nine feet in diameter, by eight feet high. At their new facility, they will be able to electroform parts substantially larger than this.

New Industrial Plating Plant



Increased industrial demand for its hard chromium plating has resulted in a move by *U. S. Metal Coatings Co.*,

Inc., from Elizabeth, N. J., to a new and larger plant at 224 Lincoln Blvd., Middlesex, N. J. The new plant has

INDUSTRIAL CHEMICALS

THE GLOBE CHEMICAL COMPANY

SOLUTIONS AND CHEMICAL SPECIALTIES

EXTENSIVE TECHNICAL SERVICE ON
Industrial Chemical Commodities
and GLOBE Proprietary Items

ACIDS ALKALIES PHOSPHATES

PAINT STRIPPERS

BATTELLE

**ELECTRO and CHEMICAL
POLISHING SOLUTIONS**

WELCOME Visitors to the American Electroplaters' Society Convention in Cincinnati May 19-22 are cordially invited to use the facilities of our general offices during the meeting.

We hope that you will visit with us.

The GLOBE CHEMICAL CO.
INCORPORATED
CINCINNATI, O.
COLUMBUS, O. — DAYTON, O. — LOUISVILLE, KY.

165/Circle on Readers' Service Card

AGATEEN!

**A large radio manufacturer*
writes: —**

"Your AGATEEN #2B clear semi-gloss has been approved."

*Name on application

**AGATE LACQUER
MANUFACTURING CO., INC.**

SERVING INDUSTRY SINCE 1927

**11-13 43rd Road
Long Island City, N. Y.
Stilwell 4-0660 - 1**

AGATEEN!

THE LAST WORD IN QUALITY

166/Circle on Readers' Service Card

facilities for handling weights up to five tons in the hard chromium plating of rolls, rams, cylinders and other large and heavy pieces of machinery and is also equipped for the copper plating and precision finishing of gravure and printing rolls for the graphic art trades.

Martin Joins Jackson Plating

Richard E. Martin has recently joined the staff of the Jackson Plating Co., Jackson, Miss., in the capacity of chemist. He will be in charge of quality control and the development of new processes.

After serving three years in the Marine Corps where he engaged in electronics work, Mr. Martin attended the University of Nebraska where he was graduated with a B.S. in chemistry. He has had 10 years progressive and responsible experience in the metal finishing field. His most recent assignment was as Chief, Surface Treatment Unit, Fabrication Laboratory, Army Ballistics Missile Agency, Redstone Arsenal. During this assignment, Mr. Martin installed and operated facilities



Richard E. Martin

for the plating, anodizing, and other surface finishing of metals. He is a member of the American Electroplaters Society and the American Chemical Society.

Diversey Continues World-Wide Expansion

Diversey Corp. of Chicago, world-

wide manufacturer of chemical products has extended its operations in Canada and the West Indies with the opening of a new, \$750,000 plant in Clarkson, Ontario. The new structure is the largest in the company's chain outside the United States, and represents the third major addition to the firm's international expansion in the past four months.

The three-quarter-million dollar building will be the new headquarters of The Diversey Corp. of Canada, Ltd., which has shown a steady growth in its twenty years from an original \$20,000 investment to current total assets of more than \$1,500,000.

The Clarkson property is located on a 22-acre site, covering 44,000 square feet of manufacturing, warehousing and laboratory areas, and over 14,000 feet of general office space. It is a two-story structure of brick and glass, with year-round air conditioning.

American Buff Co. Appoints Belanger

American Buff Co., Chicago, an-

STOP WASTING

Model
LBNI series
all plastic
self-priming
Cap. 50-350
gal. per hr.

**PRECIOUS GOLD
RHODIUM
PALLADIUM
PLATING
SOLUTIONS**



over
25 models
designed to fit
your needs
from 50-3000
gal. per hr.

write for FOLDER

**Sethco
FILTER PUMP UNITS**

No leakage, no metal contamination with all-plastic self-priming and transparent plastic filter chamber. Anti-corrosive plastic construction uses BunaN, H.T. Lucite, Neoprene, Teflon, Rigid PVC, Hypalon, Viryl, etc. Removes Particles down to one micron.

- SELF-PRIMING
- AUTOMATIC BACKWASH
- REVERSAL SWITCH
- COMPACT
- PORTABLE
- LOW COST

SETHCO Mfg. Co., 2286 Babylon Turnpike, Merrick, N. Y.

167/Circle on Readers' Service Card

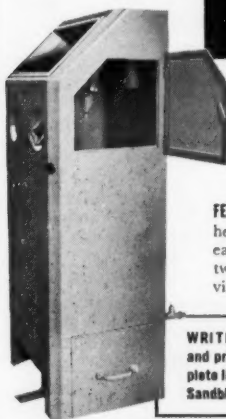
Check the jobs in your shop

- ✓ Preparing surfaces for plating and finishing
- ✓ Cleaning metal surfaces, molds, dies, tools
- ✓ Removing burrs, scale, carbon, rust, paint
- ✓ Producing satin and matte finishes
- ✓ Stenciling, lettering, trademarks

where you can

- save money
- speed production
- improve products
- with low-cost-

Cabinet Type LEIMAN SANDBLASTS



Leiman Sandblasts are equally effective on metals, glass, plastics, compositions—on small or large pieces—on small or large runs. Easy and safe for unskilled help. Require small floor space.

FEATURES: Continuous vacuum abrasive feed; heavy gauge welded steel cabinet; doors at each side; two arm holes with rubber gloves; two interior lights; foot pedal control; large viewing glass; uses all abrasives.

WRITE for folder and prices on complete line of Leiman Sandblasts

LEIMAN BROS., Inc.
105 Christie St.,
Newark 5, N. J.
Established 1887

168/Circle on Readers' Service Card



Jim Belanger

announces the recent appointment of *Jim Belanger* as Northeastern Michigan sales engineer. Mr. Belanger served in the U. S. Air Force before he became a salesman, with a strong interest in the fields of polishing and buffing. His previous connection was with Chicago Rubber Co. where his territory was also the state of Michigan.

Cowles Appoints Dutter

Cowles Chemical Co., Cleveland,

Ohio, announces the appointment of *Bruce W. Dutter* as technical representative for the Pittsburgh area which also includes Wheeling, W. Va.

For the past three years Dutter has been assistant to *William Robinson*, head of the firm's metal cleaner service laboratory and, prior to that time, was assistant engineer, Easy Washing Machine Corp., Syracuse, N. Y. He brings to his present position a very complete background of knowledge of the uses and applications of metal cleaners as well as the general subjects of plating and phosphating.

Dutter will work under the direct supervision of *Elmer Lord*, newly appointed district manager of the Northern Ohio-Eastern Pennsylvania area. He is making his home in Pittsburgh and will be available at all times to give prompt service to customers in that area.

Duffy Joins Kain & Hooven


Joseph J. Duffy, Jr., of Villanova, Pa., formerly manager of Pennsalt Chemicals Corp.'s Metal Processing Department, has joined the staff of



Joe Duffy

Kain & Hooven, Consulting Engineers, Lansdowne, Pa. Mr. Duffy's twenty years of sales engineering experience will be utilized to advantage by this growing company, which specializes in engineering services to the architectural, industrial, and construction fields.

Mr. Duffy is a graduate engineer of Villanova University, where he is currently a member of the board of lay trustees.



SPRAY MASKS

REDUCE YOUR MASKING COSTS BY USING INEXPENSIVE, HEAT RESISTANT

KWIKY-DOTS

A raised edge is automatically provided on each disc for easy grasping. Connected strings of several discs may be removed for fast application.

Stock Sizes from 1/8" up by sixteenths.

ALSO MADE FROM SPECIAL TAPES

EXTRA NARROW MASKING TAPE IN WIDTHS DOWN TO 1/32" IN STANDARD 60 YD. ROLLS

SPECIAL WIDTHS PRECISION CUT TO SPECIFICATIONS.

Send for Free Samples and Masking Catalog

BY-BUK COMPANY

4314 W. Pico Blvd., Los Angeles 19, Cal.

169/Circle on Readers' Service Card

THE S.A. DAY

MANUFACTURING CO. INC.

EST. 1912

45 YEARS OF EXPERIENCE

MANUFACTURERS OF

BUFFS AND POLISHING WHEELS

POLISHING COMPOUNDS

DISTRIBUTORS

OF

PLATING EQUIPMENT AND SUPPLIES

1483 NIAGARA ST. BUFFALO, N. Y.

LINCOLN 5424-1320

170/Circle on Readers' Service Card

NRC Equipment Corp. Names New District Sales Manager

Francis X. Maher of Willoughby, O., has been appointed district sales manager of NRC Equipment Corp., Newton, Mass., for the North Central States area. Succeeding Harry D. Stone, who was recently promoted to sales manager of the firm, Mr. Maher will direct sales and engineering service activities in Ohio and neighboring states from the company offices at 4205 Chester Ave., Cleveland 3, O.

Prior to his promotion, Mr. Maher was a sales engineer for the firm. A graduate of St. Peter's College, Jersey City, N. J., he has been in the industrial sales field for eight years and was formerly with American Optical Co. He is a member of the Cleveland Chapter of the American Society for Metals.



as the Chas. F. L'Hommedieu & Sons Co. as was done by his faithful employees during the two years he was incapacitated.

He is survived by his widow, Margaret Brown L'Hommedieu.

FRED ASTON, SR.

Fred A. Aston, Sr., retired sales manager for national accounts for Oakite Products, Inc., died on Thursday, March 6, at his home in Lauderdale-by-the-Sea, Florida. He would have been 80 years old on April 28.

Mr. Aston, a native of London, England, joined the firm in 1913 when it was four years old. He served for many years as the company's representative in Detroit and, when appointed sales

manager for national accounts in 1940, kept his headquarters there. He retired to Florida in December, 1955.

Mr. Aston is survived by his wife, Ada, and a son, Fred, Jr., sales manager of Oakite's package division.

News from California

By Fred A. Herr



John Millhorn, head of Millhorn Chemical & Supply Co., reports completion of an expansion program which has added some 3,000 square feet of warehouse and production space to his

plant at 6507 Compton Ave., Los Angeles.

Millhorn also announced that his firm has been appointed as a west coast distributor for the products of Wyandotte Chemicals Corp., of Wyandotte, Mich. John J. Tarczynski has joined the staff as a sales engineer. John was formerly affiliated with Superchrome Engineering Co. of Los Angeles, for which firm his brother, Kasimir "Cass" Tarczynski serves as plant manager.

The youngest and most vivacious lady ever to attend an affair of Los Angeles Branch of the A.E.S. is Miss Eva May Roter, who enlivened the noonday luncheon of the branch's annual Educational Session at the Am-

OBITUARIES

ARTHUR W. L'HOMMEDIU

Arthur W. L'Hommedieu, president of Chas. F. L'Hommedieu & Sons Co., died in his home at La Grange, Ill., after an illness of over two years on Sunday, April 13 and was buried on April 16. He was in his 82nd year.

Mr. L'Hommedieu was the last member of the original incorporators of the firm founded by his father, Chas. F., brother, Charles Edward, and sister, Alice L'Hommedieu. It was his wish that the firm, presently celebrating its sixtieth anniversary, continue

IMPROVE PLATING and ALKALINE DE-RUSTING



WITH PERIODIC-REVERSE UNITS OF FINEST QUALITY

WRITE FOR INFORMATION

UNIT PROCESS ASSEMBLIES, INC.

61 East Fourth Street • New York 3, N. Y.



171/Circle on Readers' Service Card

SPEED-UP your nickel stripping PROTECT the base metal

with STRIPODE

A proved addition agent, STRIPODE strips nickel plate faster and protects the base metal from pitting, roughening and etching. Also saves on use of acid, eliminates need of sand blasting or heavy buffing operation. Try it!

ORDER A TRIAL GALLON!

THE CHEMICAL CORPORATION
54 Waltham Avenue
SPRINGFIELD • MASSACHUSETTS

172/Circle on Readers' Service Card

bassador Hotel on March 22 with her gay presence. Eva May, who is three, "going on four," is the daughter of Meyer Roter, partner in the Arcraft Plating & Finishing Co. of Burbank, Calif. She attended the luncheon with her Dad and Mom, and Mr. Roter's cousin, Mrs. Pearl Green. Eva May was drafted to draw the tickets for the prize drawing out of a revolving barrel and had herself such a delightful time that, at the conclusion of the luncheon, Eva wound up as the spontaneous choice of all present as "Miss A.E.S. of 1958."

Handy & Harman officially opened its new plant for fabrication and recovery of precious metals and their alloys at 330 North Gibson Road, El Monte, Calif., on March 26.

An invitational preview luncheon was hosted at the new building by Judson C. Travis of New York, president; Herman Folgner, manager of the new Southern California facility; Philip G. Duechler, the firm's West Coast district manager, and other executives. After the luncheon, visitors were taken



on an inspection trip of the new facilities and were enabled to view the plant in operation. An industrial display, showing the purposes for which precious metals are used in science and industry, was on the program from 4 to 7 p.m.

The new building was described as the largest precious metal facility West of Chicago. Its plant area of 25,200 square feet more than doubles the com-

pany's former plant in Los Angeles which the El Monte facilities replace.

A visitor to the West Coast in March was M. M. Beckwith, manager of the plating division, Harshaw Chemical Co., Cleveland, O. One of his assignments on the West Coast was to address San Francisco Branch, A.E.S., on "Nickel Plating." His guide and

BEAM-KNODEL CO.

Metropolitan Distributors

HANSON-VAN WINKLE-MUNNING CO.



Complete Service for Metal Finishing

Products Listed Below Available in New York
Stock With Reasonable Exceptions

GENERATORS

Anodes, All Kinds
Brushes
Buffs
Chemicals
Tripoli Comp.
Acme White Finish

Tallow
Rouge
Emery Paste
Cleaners
Emery
Glue

Nickel Salts
Copper Salts
Cyanide
Tanks, All Kinds
Plating Barrels
Polishing Wheels
Polishing Lathes

195 LAFAYETTE ST., COR. BROOME
Phone CAnal 6-3956-7 NEW YORK 12, N. Y.

FILTERS

MAIZO
Drying
Materials

LEA Buffing
& Polishing
PRODUCTS

173/Circle on Readers' Service Card



HANSON - VAN WINKLE - MUNNING CO.

on the West Coast

is

Alert

For H-V-W-M products, processes
and service

Call

Alert SUPPLY COMPANY

subsidiary of

HANSON-VAN WINKLE-MUNNING CO.

MATAWAN, N. J.

2041 Davie Ave., Los Angeles
RAymond 3-8641

923 Harrison St., San Francisco
SUtter 1-4563

174/Circle on Readers' Service Card

companion during the Los Angeles phase of his trip was *Herold Kroesche*, with whom he attended the branch's annual educational session on March 22.

Herman A. Ey, Jr., manager of national cleaner sales for Hanson-Van Winkle-Munning Co., dropped into Los Angeles for a visit from his headquarters in Grand Rapids, Mich., in March. Herman attended the March 12 meeting of Los Angeles Branch, A.E.S., to renew acquaintanceships with the many folks in the finishing business with whom he was in contact while associated with Mido Products of Torrance, Calif., for several years.

George W. Fulton has been named West Coast regional sales manager for DeVilbiss Co., succeeding *D. L. Bohon* who has been transferred to the home office sales department in Toledo, O. Fulton headquartered at the branch plant in Los Angeles. He served as branch manager at the factory in Santa Clara, Calif., from 1951 to 1953, and as west coast manager since 1953.

Don Bedwell, who retired as plant superintendent of the Hall-Mak Co. of Los Angeles in July, 1957, and Mrs. Bedwell, motored to Mexico City early in March. Don reports having a splendid time in the romantic Latin republic, but did not come within half a mile of a plating shop.

Square Deal Machine Co., South Gate, Calif., manufacturers of automatic and semi-automatic polishing and buffing machines has announced

the appointment of *William Holmes* to his design engineering staff. Holmes formerly served in a similar engineering capacity with the U. S. Flexible Tube Co. of Los Angeles.

George Gadbois, technical director of the Honite Div., Minnesota Mining & Mfg. Co., spent a combination business and vacation trip to Los Angeles during the latter part of March. His promotion from sales manager to technical director of the division took effect on April 1.

San Francisco Branch, A.E.S., was represented at Los Angeles Branch 1958 annual educational session on March 22 by *Guy Cordrott*, San Francisco Branch vice-president; *Alfred F. Lee*, of the A. A. Plating Works, San Francisco; and *Frank W. Huntington*, a past-president of the branch, who operates a plating consulting service in Alameda, Calif.

Milton Weiner, who operates a chemical analysis and plating consultant laboratory at 671 West Putnam Drive, Whittier, Calif., reports that he has added training programs to his existing services to the metal finishing industry. The training programs are conducted on an individual basis at each shop. The scope of the training program is varied to cover the type of plating or finishing performed at the plant. Included in the course are chemical analyses, correct chemical maintenance of solutions, optimum plating operation, metal preparation and calculations.

Associations and Societies

AMERICAN ELECTROPLATERS' SOCIETY

British Columbia Branch

The general meeting of March 27 was held at the White Spot Dining Room, 25th & Cambie, with 31 members and guests present.

Pres. *W. Marquardt* explained how the electroplating course came into being, gave credit to those who had laid out the course and thanked *Walter Kellerman* the instructor. Following this he presented diplomas to the nine graduates who had attended the dinner meeting as guests of the local branch. As chairman of the nominating committee, he also gave a preliminary report of his committee with suggestions for the coming election at the May meeting.

Secty. *J. Lee*, in the absence of Treasurer *R. Price*, read the financial report which indicated a net bank balance of \$225.01 to date. Following this, notice of the 15 month year was given, the dues to be \$12.50 rather than \$10.00 for this next year only.

After a short intermission, the president introduced the guest speaker, *Dave Hanna*, of Canadian Hanson & Van Winkle Co. Ltd., Toronto, who gave a very interesting talk on recent developments and experiments in the bright nickel field. He explained how their laboratory had compared Watts type as well as high chloride solutions, both mechanically as well as air

METALLIZING NON-CONDUCTORS

\$2.00 PER COPY

* * * *

DICTIONARY OF METAL FINISHING CHEMICALS

\$3.00 PER COPY

* * * *

BOOK ORDERS PAYABLE IN ADVANCE

METAL FINISHING

381 BROADWAY

WESTWOOD, N. J.

175/Circle on Readers' Service Card

Zialite

Reg. U. S. Pat. Off.

for NICKEL PLATING

The one bath especially designed for plating DIRECTLY on ZINC, LEAD, ALUMINUM, BRASS, COPPER and IRON.

for HARD CHROMIUM

USE Zialite ADDITION AGENTS

Harder CRACK FREE deposits. Increased throwing power. Less sensitivity to sulfate content. Exceptionally fine results plating anything calling for Decorative or Hard Chrome.

ZIALITE CORPORATION

92 GROVE STREET

WORCESTER 5, MASS.

176/Circle on Readers' Service Card

agitated, from a throwing and covering power point of view; with the air-agitated high chloride showing the most improvement over the plain Watts type. He then took up the question of throwing power, and illustrated his talk with slides showing varying thicknesses of the different baths on gramophone record stampers. Various other characteristics were discussed, after which a question and answer period kept the group actively interested until the conclusion of the evening.

J. Lee
Secretary

Southeastern Branch

The Southeastern Branch held its regular monthly meeting on Friday night, March 14, at the Belmont Steak House in Atlanta with 36 members and guest present. *William K. Murray*, manager of the technical section, Enthone, Inc., spoke on "Adhesion of Electrodeposits and New Methods of Cleaning and Oxide Removal."

Plans were announced to form a Dixie Regional organization consisting of the Southeastern, Miami, and Blue Ridge Branches to sponsor annual technical meetings. New officers elected were: President — *Claude J. Nalley*; 1st Vice President — *Bob M. Taylor*; 2nd Vice President — *Robert H. Probert*; Librarian — *Mrs. Jerita Wilson*; Treasurer — *Wilmont D. Tidd*; Secretary — *Robert H. Probert*.

Robert H. Probert
Secretary

Miami Branch

On Feb. 20th, the members of the Miami Branch arrived at Jerry's

Restaurant for their monthly meeting. After dinner, President *M. H. Dent* introduced *Dr. R. B. Saltonstall* of Udylite, who spoke about "Corrosion studies of Ni-Cr plate." Another visitor at this meeting was *Dr. H. Kellner*, of Lea Mfg. Co.

On Sat. Feb. 16, delegates *S. Gibbs*, *M. H. Dent*, and *F. Marinello*, attended the third annual technical session of the Southeastern Branch in Atlanta. At that time, subject to approval of the national officers, the Miami Branch, the Southeastern Branch, and the Blue Ridge Branch formed a region, to be known as the Dixie Region, with *J. Taylor* as chairman and *R. Probert* as secretary. The first technical session will be held in Atlanta, and the second in Miami.

Robert F. Wharton
Librarian

Chicago Branch

The monthly meeting of the branch was held on Friday, March 7 at the Western Society of Engineers. The election of officers for this year took place and the following candidates were elected to office by the members present: President, *R. Scott Modjeska*; 1st vice-president, *Charles Geldzahler*; 2nd vice-president, *Matt Dassinger*; Librarian, *Joseph C. Corre*; Secretary-treasurer, *Paul Glab*.

The program for the evening was a color film "Corrosion in Action" as prepared by the Engineering Section of the International Nickel Co., Inc. The film graphically illustrated how corrosion action occurs and what measures can be taken to stop it.

Dr. Joseph Dralay and *Dr. J. H. Monaweck*, both from Argonne Na-

tional Laboratory in Lemont, Ill., served as a discussion panel on the subject of corrosion. A very worthwhile question and answer followed.

Christopher Marzano
Publicity Chairman

Mohawk Valley Branch

A. D. Squitro, chief chemist for Hanson-Van Winkle-Munning Co. of Matawan, N. J., spoke on "Bright Nickel Plating" at the February meeting. The subject was well received by members who operate nickel baths. A very lively question and answer period followed the discussion.

The March meeting of the Mohawk Valley Branch was well attended and for a very good reason. *Rene Sonnenfeld*, of Sel-Rex Corp., spoke on "American Plating Practices compared to the European." This subject and the speaker proved to be both informative and entertaining. Mr. Sonnenfeld was very much at home during the question and answer period, due to having traveled extensively in the European countries where many questions are asked relative to the plating field.

Charles P. Raehm, Jr.
Sec.-Treas.

Detroit Branch

Approximately one hundred members, their wives and guests met in the Wayne Room of the Statler Hotel on March 7 for the annual Ladies Night. The ladies were welcomed by President *Glenn Friedt, Jr.* *Dick Watson*, president of the Grand Rapids Branch, was introduced by Mr. Friedt and asked for the Detroit Branch's support for *Chester G. Borlet* in his bid for the A.E.S. third vice-presidency.

INDUSTRY . . . large and small . . . relies on RANDOLPH for highly suitable finishes

Lacquers • Synthetic Enamels • Air-Dry Lacquers
Baking Enamels • Wood Lacquers • Texture Enamels
Aircraft Dopes • Aircraft Enamels
Specialized Production Finishes for exacting requirements in
QUALITY • UNIFORMITY • PROTECTION
ATTRACTIVENESS • ECONOMY

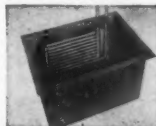
Prompt Shipment

RANDOLPH PRODUCTS COMPANY
CARLSTADT, N. J.

177/Circle on Readers' Service Card

YOU WILL STOP USING PIPE COILS

as soon as you know the many advantages of this Dean product which TAKES THE PLACE of old-style pipe coils. Costs less. Less space. Weighs less. More efficient. More economical. Ask for complete data and prices.



**DEAN.
THERMO-PANEL
COIL**

Backed by 20 Years of
Panel Coil Manufacturing.

DEAN THERMO-PANEL COIL DIVISION
DEAN PRODUCTS, INC. 613 Franklin Ave. BROOKLYN 38, N. Y.
Tel. STerling 9-5400

178/Circle on Readers' Service Card

Five applications for membership were submitted by Secretary *Ed Kubis* and were unanimously approved. The ladies' auxiliary president, *Mrs. Howard (Betty) McAleer* served as technical chairman for the evening and gave a brief history of the auxiliary and extended an invitation to all branch members' wives to join this group. Mrs. McAleer introduced the evening's speaker, *Miss Irene Meyers* of Fort Wayne, Ind., whose talk entitled "Magic Flight to Europe," gave all the interesting and heartfelt sidelights of Miss Meyers' experiences as host and chaperon to the all-female groups on their foreign tours.

Dancing and refreshments were enjoyed by all till early in the morning to close what was probably the most enjoyable Ladies Night of the branch's history.

Robert J. Amis,
Publicity Chairman

Waterbury Branch

The March meeting was held on Thursday, March 13, at the Roger Smith Hotel. The meeting was opened by President *Spencer Henn*. *Frank Eddy* named the slate of officers presented at the last meeting, and the following were elected to office: President *Edward J. Garland*, 1st Vice-President *Frank Tirendi*, 2nd Vice-President *William C. Giesker*, Librarian *Louis Porretti*, Assistant Librarian *Edward B.*

Washburn, Research Chairman *Raymond L. Mitchell*, Publicity Chairman *Francis A. Schneiders*, Secretary-Treasurer *Albert G. Griffith*, Board of Managers *Theodore Voyda*, *Spencer L. Henn*, *Isidore Cross*.

Secretary *Al Griffith*, gave a report on the membership status, and suggested the April meeting be designated as "Bring a Guest Nite." *John Nichols*, executive secretary gave a brief report of the changes in the by-laws of the national society. He also congratulated *Ray Mitchell*, chairman of the research program of the branch for an outstanding record for sustaining membership.

The speaker for this meeting was *Dr. Joseph V. Petrocelli*, head of the electro-chemical section, International Nickel Co., Bayonne, N. J. His subject was "Electrode Reactions in Electrodeposition and Corrosion." A large group turned out to hear our former president and enjoyed his talk very much.

Nicholas Topazio
Publicity Director

Buffalo Branch

The March 7 meeting of the Buffalo Branch was held at the Niagara Manor, 899 Niagara Falls Blvd., Buffalo.

After dinner, the group proceeded with the regular business meeting at 8:00 P. M. sharp.

Frank Bueckman and *Linwood Morrison*, visitor from the Rochester

Branch gave all a hearty welcome to the Regional, to be held at Rochester April 19, 1958. They have planned a program including complete dual sessions on both organic and metallic finishes with top-flight speakers in both fields, and a fashion show for the ladies.

Harold Shapiro, Librarian, presented the speaker of the evening, *Geo. Cavanaugh* of Syracuse Branch, manager of chemical research for the General Electric Co. at Syracuse. His clear, concise statement of the use of parliamentary law from the history of its earliest uses, to the explanation of his own simplified parliamentary guide, gave the group an amazing insight of a subject which, previously, has been seemingly an impossible task.

Ralph D. Stemmerich
Secretary

Kansas City Branch

The March 13 meeting was distinguished by a number of outstanding features. It was called to order by President *George Becker*. Minutes of the February meeting were read and approved. The committee on the Annual Stag Party reported and offered two dates for the Branch's consideration. By a vote of the membership, June 20 was chosen and the committee instructed to go ahead with arrangements.

The matter of the 1959 Interim

EPC - 300

(McCoy's Copper)

SINGLE ADDITION BRIGHTENER
THE MOST TALKED ABOUT PROCESS
IN THE MIDWEST

It produces deposits which are bright from deep recesses to very high densities.

When used under recommended conditions with Electrosolv, (Electrosolv is a superior addition agent for the improvement of anode corrosion) it is capable of depositing copper at the rate of a mil. in 10 minutes.

Operating range is wide:
Temperatures from 140-180°F.
Wide range of solution composition.

Air Agitation with 300-W.
Non-foaming wetting agent foaming.
No electrocleaning required for direct plating with nickel.

ELECTROCHEMICAL PRODUCTS CO.
2800 W. Glendale Ave., Milwaukee 9, Wis.

179/Circle on Readers' Service Card

KARR • GRIT MEAL FLOURS

In uniform sizes for tumbling, blasting, foundry, compounds, drying and polishing, etc.

MAIZE CELLULOSE

(Derivative from corn plant)

"U. S. PATENT #2,733,145"

Cellulose is the "skeleton" of all plant life. We extract the most fibrous portion and in comparison to sawdust it lasts longer and does many things. Write for descriptive literature and nearest source of supply.

KARR & CO.

923 E. Broad St. Columbus 5, Ohio

180/Circle on Readers' Service Card

Park
No. 290

BLACKENING SALT

Black Oxide finishing for rust resistance and decorative parts. Speedy black coating in water solution with no electric current. Permanent black finish on ordnance parts, tools, aircraft, bearing races. Dazzling black decorative finish for television cameras, business machines, hardware, metal screens and machine parts. Excellent bond for paints and enamels. Simple one bath operation. Write for bulletin H-16. Park Chemical Co., 8074 Military Ave., Detroit 4, Mich.

181/Circle on Readers' Service Card

Meeting of the Supreme Society was brought up and, after discussion, the Branch voted to extend an invitation to hold that meeting in Kansas City. *Bob Garrett, Bill DesJardins, Henry DeWitt, and Dick Loupee* were appointed a committee to draw up and present the invitation and make tentative arrangements. Announcement of the Annual Election at the May meeting resulted in the appointment of *Bob Lee* as chairman of the nominating committee with the rest of the committee to be announced at the April meeting. The applications of *Herbert L. Oakes*, of Merit Mfg. Co., *Merlin Marcum* and *Dennis Onwiler* of Bendix, and *H. B. Hoelsy*, of Metal Finishers, were read and, in due time, they were elected to membership in the Branch.

The meeting was turned over to Librarian *Scott Sterrett*, who introduced the speaker of the evening, *Ralph Petit*, who spoke on the subject, "Finishing of Aluminum." Mr. Petit began at the beginning and told the story of the discovery and development of aluminum and the industry. He touched on the various processes for finishing aluminum, then went into detail on some of the newer and unique processes and illustrated this portion with color slides. At the conclusion of his prepared talk he answered questions which indicated the interest his presentation had stirred in those who heard him. He was warm-

ly thanked for his informative talk.

Announcement was made of the meeting and subject for the month of April and the meeting was closed at 10:30 P.M.

Robert L. Garrett,
Secretary

Los Angeles Branch

The 28th annual Educational Session and Dinner Dance of Los Angeles Branch was held at the Ambassador Hotel, Los Angeles, on March 22 and, in technical presentations during the day-time sessions and entertainment at the evening dinner dance, matched the mark these events had set in past years.

Educational Chairman *Frank Virgil* presented three well-known figures in the metal finishing field on the technical program which began at 9:30 a.m. Of timely interest was a paper presented by *Leo Missel*, manufacturing research chemist of the Lockheed Missile System Division, Lockheed Aircraft Corp., Van Nuys, Calif. Mr. Missel spoke on "Thermal Shock Resistant Nickel Plating on Copper." Since the problems concerned with metal deposition on missile parts are quite different than those met with in ordinary metal coating due, the speaker explained, to the tremendous speed with which missiles travel, and dust particles in the air which have a corrosive effect on

the missile. This talk attracted an attendance of 150 members and guests as the opening speech at 9:30 a.m.

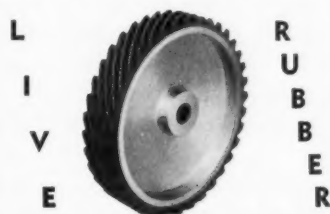
William H. Jackson of the Udylite Corp., Detroit, Mich., followed with a paper on "Plating Barrels and Barrel Processing Equipment." The speaker described various types of barrels and auxiliary equipment and outlined what particular types of barrels are best for certain types and shapes of parts.

The third speaker was *E. C. Rinker*, vice president of the Sel-Rex Corp., Nutley, N. J. His subject was "New Developments in Precious Metal Plating." Mr. Rinker presented data designed to acquaint the audience with the processes that are being used successfully in industry today and to briefly describe the physical and metallurgical properties of the various electro-deposits.

The technical program was conducted in one continuous session from 9:30 a.m. to 1 p.m. Following a half hour cocktail hour, the noonday luncheon was called to order at 1:30 p.m. by Toastmaster *Kenneth C. Johnson*, with 140 members and guests in attendance. The luncheon was featured by the distribution of some 50 or so door prizes.

The dinner dance began at 7:30 p.m. in the Embassy Room of the Hotel Ambassador. Between 450 and 500 members and their ladies were in at-

Now Available!



CONTACT WHEEL

The New Duro-Red Live Rubber contact wheel — Faster, smoother, cleaner grinding and polishing.

It's the Live Rubber that makes the difference. It's been proven!

WRITE TODAY FOR INFORMATION.

THE NAZAR RUBBER CO.
2727 Avondale, Toledo 7, Ohio

182/Circle on Readers' Service Card

ANODIZERS -

NEED LOWER COSTS?

WANT INCREASED PRODUCTION FROM EXISTING FACILITIES?

WANT BETTER QUALITY AND FEWER REJECTS?

BRING YOUR RACKING PROBLEMS TO THE CONVENTION

CALL JIM TRINZ AT THE SHERATON-GIBSON MAY 19th or 20th

OR WRITE TO

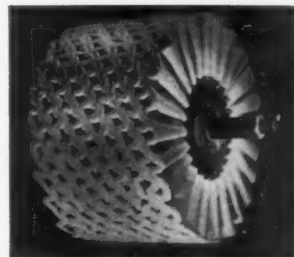
ANODIZING RACK DIVISION
SERVICE SCREW PRODUCTS COMPANY
131-Z North Green Street, Chicago 7, Ill.

183/Circle on Readers' Service Card

Cooler, Faster Buffing

with

45° Spoke Buffs



Patented spoke mounting principle maintains best cutting angle of 45° for faster, smoother cutting with less pressure and no streaks. Ventilation from 24 openings.

Write for folder.

GUARANTEED BUFF CO., INC.
20 VANDAM ST., NEW YORK 13, N. Y.

184/Circle on Readers' Service Card

tendance at the dinner dance which annually represents the social highlight of Los Angeles Branch. Every lady was presented with a beautiful prize as she entered the ballroom. Dance music was by *Carroll Wax* and his orchestra. In between dances, General Chairman *Phillip Simon* and several assistants presented the door prizes, of which approximately 300 had been donated by 73 plating firms and supply houses.

John Millhorn again presided as director of the waltz contest. John originated this feature during his term as branch president about six years ago, and it has since grown into a "must" on the evening program of each annual dinner dance the branch sponsors.

After some 15 other couples had been eliminated there emerged as winners of the contest *Mr. and Mrs. Richard Snyder*. Each received a beautiful trophy which had been donated by the Kaag Mfg. Co.

Southeastern Branch

The Southeastern Branch, in combination this year with the Blue Ridge and Miami Branches, held its 3rd Annual Technical Session on February 14 and 15 at the Dinkler Plaza Hotel in Atlanta. General Chairman *Howard Bone* opened the meeting and, after a few words from Branch President *Charles Lewis* and National President *Francis Eddy*, and recognition of National Past President *Dr. Samuel Heiman*, Miami President *Duke Dent* and Blue Ridge 1st Vice President *Dr. N. F. Murphy*, the group journeyed to Scripto, Inc. for a plant tour, guided by Branch President *Clyde Stovall* and Librarian *Wilmont D. Tidd*. On Friday afternoon members heard *Henry Mahlstedt* of Metal & Thermit Corp. on "New Concepts in Corrosion of Chro-

mium Finishes" and *R. V. Vandenberg* of Aluminum Co. of America on "Recent Developments in Aluminum Anodizing." Meanwhile the ladies, under the chairmanship of *Mrs. Charles I. Lewis*, assisted by *Mrs. B. M. Bone* and *Mrs. Clyde Stovall*, were enjoying lunch at the Standard Town and Country Club, a fashion show and the infamous Cyclorama. Saturday morning we heard *Herman Ey* of H-VW-M Co. on "Cleaning Aluminum," *Clarence H. Sample* of International Nickel Co. on "Specifications & Tests of Electrodeposited Coatings", and *Dr. Richard B. Saltonstall* of Udylite on "Nickel Plating." Several of the job shop men had lunch with the officers of the National Association of Metal Finishers and formed a local chapter for Atlanta and Miami. NAMF officers present were President *John Palik*, 1st Vice President *Harold W. Baker*, Executive Secretary *P. Peter Kovatis*, Secretary-Treasurer *Frank Kaiser*, Assistant Secretary-Treasurer *Sal Novelli*, Directors *Mariano Ranno* and *George W. Taylor*. At 2:00 P. M. on Saturday the first joint committee of the Southeastern, Blue Ridge, and Miami Branches met and drew tentative by-laws for the proposed Dixie Region. Saturday night the Branch rolled out its traditional feast. The committee consisted of General Chairman *Howard Bone*, *M. M. Randman* (Registration), *Wilmont D. Tidd* (Education), *Justis V. Belville* (Entertainment), *George W. Taylor* and *Bob M. Taylor* (Program), *Robert H. Probert* (Secretary-Treasurer).

Los Angeles Branch

Los Angeles Branch eliminated the usual technical educational talk at its March 12 meeting in order to devote the entire program to election of new officers and discussion of final ar-

rangements for the branch's 1958 annual educational conference at the Ambassador Hotel.

Norman McEwan of Virtue Bros., Los Angeles, was elevated from the first vice-presidency to branch president for the 1958-59 term by unanimous vote of the membership. He succeeded *George Magurean* as president, who was named to the board of managers along with two other past-presidents — *Edward Wells* and *Truman Stoner*. Installation will be held at the April 9 meeting in Rodger Young Auditorium, with *Earl Coffin* serving in his traditional role as installation chairman.

A. J. Needsweedy and *Lincoln A. Lowe* had their applications for membership approved. Applications were routed to the board of managers for examination from *L. L. Lunt*, *Carl Troncall*, *L. E. Fleming* and *William J. Saunders*.

Secretary *Babcock* reported on the new plan of the Supreme Society to bill membership dues for the next term for 15 months in 1958-59. No dissenting voice was raised to the idea of making the next period endure from March 31, 1958, to June 30, 1959.

Preliminary plans were announced by President *Magurean* for making the visit of National President *Francis T. Eddy* of Thomaston, Conn., a memorable one. Mr. Eddy was scheduled to arrive in Los Angeles in mid-April at a time that would not coincide with the branch's regular monthly meeting on April 9. Arrangements therefore, were, to be made for a special meeting of the branch on April 22 at which West Coast members were to be given an opportunity to meet the Supreme Society head and hear his comments on national organization matters.

Newark Branch

The Mar. 31 meeting was held at the

HAMILTON MILLS

**INDIAN BRAND
TURKISH EMERY**

For color and lustre beyond compare, specify **INDIAN BRAND TURKISH EMERY**. Preferred by those who know the best.

Also available — **HECCO BRAND AMERICAN EMERY**, for use in abrasive pastes and compositions.

HAMILTON EMERY & CORUNDUM CO.
CHESTER, MASS.

185/Circle on Readers' Service Card

"\$25 A WEEK RAISE"

"I have practically taken over all the plating in the shop since Sept., 1957 after having completed a little over half your lessons. The best part though is a \$25 a week raise even during the present recession. Thanks!" writes plater *Edward Osborne*. The way to get ahead in good times or bad is to know more! Write **Dr. Joseph B. Kushner**, Electroplating School, 115 Broad St., Stroudsburg 16M, Pa.

186/Circle on Readers' Service Card

SOMMERS BROS. MFG. CO.

MFRS. OF "BEACON"

Plating and Polishing Supplies and Equipment — Complete Semi and Full Automatic Installations — Gold, Silver and Chrome Rouge, Stainless Steel and Satin Finish Compounds — Buffs, Polishing and Felt Wheels.

**3439 NO. BROADWAY
ST. LOUIS 7, MO.**

187/Circle on Readers' Service Card

Hotel Robert Treat with sixty-five in attendance. One application was received and the following were elected to membership: *Norman Gaynes* of Titanine, Inc., *Stephen Kriso* of Kriso's Electro Plating Co., *George Thompson* of Lovell Dressel Co., *Milton Treuhart* of the Microwave Research Institute and *L. P. Vollmuth* of Bart Mfg. Co.; *Joseph Petrocelli* of International Nickel Co. was transferred from Waterbury to Newark. Messrs. *Thomas Monte* and *William Spence* were suspended.

Visitors *Ed Saubestre* and *Don Wood* of New York Branch were introduced. *Dodd Carr* transferred the copyright on the Newark Branch Electroplating Course Manual, "Basic Practical Electroplating," to the Branch.

The following officers were elected: *Gustave Bittrich*, president
Fred Meyer, first vice-president
John Banta, second vice-president
Don Foulke, secretary
George Wagner, treasurer
Al Korbela, librarian
Howard Martin, sergeant-at-arms
Thomas Austin, *William Grigat*, *George Reuter*, *Clifford Struyk*, board of managers.

Edward Faint, one of Newark Branch's oldest members and a charter member of the Society, charged and installed the officers, all of whom were present except Mr. Wagner, who was vacationing in Florida.

Librarian Korbela then introduced *Leonard Fox* of RCA who presented as his Timely Topic an interesting paper on the "Plating of Semiconductors and Transistors." He described the use of nickel, gold and lead-tin baths for various reasons and noted the use of electrodeless nickel in certain applications.

Dr. Fred Lowenheim, Metal and

Thermit Corp., discussed "Corrosion of Plated Finishes." Colored slides of corrosion panels were shown for copper-nickel-chromium, nickel-chromium, tin-nickel, copper and tin-nickel, and copper and tin-nickel with a chromium top-coat, for various types of exposure.

Columbus Branch

The regular monthly meeting of the Columbus branch AES was held on Friday, March 7 at 6:30 P.M. in conjunction with a dinner and tour of the Jeffrey Mfg. Co.

Following the dinner a short business meeting was held, at which *John Gurklis* was elected as a member of the branch.

The members present were then divided into groups and taken on an extended tour of the Jeffrey plant.

Halvor S. Christianson
Secretary

NEW BOOKS

The Industrial pH Handbook

Edited by T. J. Kehoe. Published by Beckman Instruments, Inc., Process Instruments Div., 2500 Fullerton Road, Fullerton, Calif. 1957. 55 pages plus index. Price: \$2.00. Paper cover.

Although this piece of literature contains some interesting material such as charts, tables and a bibliography, it is really a catalog of the manufacturer's instruments and their applications. Were it not for the fact that

there is a charge for the book, it would more properly be listed in the "Manufacturers Literature" section of METAL FINISHING. Designers of pH control systems will find a wide variety of installations illustrated and, in all fairness, it should be emphasized that competing units could easily be substituted. However, in view of the major portion of the material presented describing a specific line of meters, electrodes, and ancillary equipment, purchasers should be under no misapprehension as to the purpose of this publication.

1957 Supplements to Book of ASTM Standards

Published by American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. Heavy paper covers; 7 parts; \$4.00 per part; \$28.00 per set.

Part 1. Ferrous Metals — 520 pages. Includes 80 standards.

Part 2. Non-Ferrous Metals — 330 pages. Includes 56 standards.

Part 3. Cement, Concrete, Ceramics, Thermal Insulation, Road Materials, Waterproofing, Soils — 360 pages. Includes 60 standards.

Part 4. Paint, Naval Stores, Wood, Cellulose, Wax Polishes, Sandwich and Building Constructions, Fire Tests — 218 pages. Includes 33 standards.

Part 5. Fuels, Petroleum, Aromatic Hydrocarbons, Engine Antifreezes — 340 pages. Includes 76 standards.

Part 6. Rubber, Plastics, Electrical Insulation — 423 pages. Includes 70 standards.

Part 7. Textile, Soap, Water, Paper, Adhesives, Shipping Containers — 280 pages. Includes 40 standards.

KRAFT



highest
purity

ANODES

CHROMIC ACID

TRICHLORS

CYANIDES



POTASSIUM CYANIDE

½ OZ. FUSED CYLINDERS

SAFE . . . SAFE . . . SAFE . . . SAFE

★ cyaNODES

- HIGHEST PURITY
- SULFUR FREE — USED FOR ALL ELECTROPLATING PURPOSES
- NON FLAKING, NON DUSTING
- QUICKLY SOLUBLE . . . UNIFORM SIZE
- EASY TO IDENTIFY — LOOK LIKE MARSHMALLOWS

KRAFT CHEMICAL COMPANY
917 W. 18th ~ CHICAGO 8

ADVERTISING RATES

Per column inch per insertion	
1 time	\$12.00
3 times	11.00
6 times	10.00
Yearly (12 times)	9.00

READY REFERENCE SECTION

CLEANING • POLISHING AND BUFFING • ELECTROFORMING
ANODIZING • RUSTPROOFING • PLATING • BARREL FINISHING
VACUUM METALIZING • LACQUERING AND ENAMELING

Rebuilt Equipment

PLATING M/G SETS
FULL CONTROL PANELS

1—5000/2500 ampere, 9/18 volt Chan-
deysson Syn. 25° exciter in head.
Built in 1943.

1—(Twin 3000 ampere) 6000/3000
ampere, 12/24 volt Chan-
deysson Syn. exciter in head.

REBUILT RECTIFIERS

GUARANTEED REBUILT PLAT-
ING RECTIFIERS — 3 PHASE, 60
CYCLE, 220/440 VOLT. COMPLETE
WITH OPERATING ACCESSORIES.

Rapid Electric Selenium Type 5000A,
0-6 Volt.

Udylite 3000/0-6 Selenium Type.

R. A. 2000A/0-6 Selenium Type.

M/U Copper Magnesium Sulphide
1500/0-6 volt.

SPECIAL

Koroseal-lined Tanks, 7' x 4' x 4'6".

Koroseal-lined Tanks, 5' x 42" x 3'.

LaSalco 2 cyl. Mechanical Plating Bar-
rel Unit for cyanide solutions, 16"
x 36"

Industrial Cyanide Filter — 600 GPH

#2 Globe Tumbling Barrels M/D

#5 Globe Tumbling Barrels M/D

Alsop SD8 Filter

Industrial Filter — Acid — 100 GPH

NEW AND REBUILT POLISHING AND
BUFFING LATHES — CONSTANT
AND VARIABLE SPEED — SINGLE
AND DOUBLE MOTOR DRIVES — 3
PHASE, 60 CYCLE, 220/440 VOLT,
1 TO 20 H.P. IN STOCK.

LATHES

L'Hommedieu double 5 H.P. Model
18A Vari-Speed

L'Hommedieu 1 H.P. Model 21 Vari-
Speed

Hammond Double 5 H.P. Model RR
Constant Speed

Hammond 5 H.P. Model RH Constant
Speed

Cincinnati Double 5 H.P. Constant
Speed

Divine 5 & 7½ H.P. Model VCS Con-
stant Speed

Gardner 5 - 7½ H.P. Model 3DB Con-
stant Speed

L'Hommedieu 5 H.P. - 20 H.P. Model
12 Constant Speed

Acme Semi-Automatic Work Holders

NEW CLINTON FAN COOLED SELE-
NIUM RECTIFIERS COMPLETE WITH
BUILT-IN VOLTAGE REGULATION
AND ALL NECESSARY OPERATING
ACCESSORIES.

WE CARRY A COMPLETE LINE OF
NEW AND REBUILT PLATING AND
POLISHING EQUIPMENT.

CLINTON SUPPLY COMPANY

112 South Clinton Street
Chicago 6, Illinois
FRanklin 2-3753

Save More
IMMEDIATE SHIPMENT!

Select from one of the nation's largest
stocks of guaranteed rebuilt electro-
plating motor generator sets and recti-
fiers with full control equipment.

PLATERS

1—10,000/5000 AMPERE, 6/12 VOLT.
H-VW-M Synchronous. Exc.-in-head.

1—8000/4000 AMPERE, 6/12 VOLT.
CHANDEYSSON, Synchron.

1—7500/3750 AMPERE, 9/18 VOLT.
HANSON - VAN WINKLE - MUN-
NING, Synchronous.

1—6000/3000 AMPERE, 6/12 VOLT.
ELECTRIC PRODUCTS, Synchron.

1—5000/2500 AMPERE, 9/18 VOLT.
CHANDEYSSON, Synchronous. Exc-
iter-in-head.

1—4000/2000 AMPERE, 6/12 VOLT.
H-VW-M, Synchron. Exc.-in-head.

3—3000/1500 AMPERE, 12/24 VOLT.
CHANDEYSSON, Exciter-in-head.

1—2000/1000 AMPERE, 6/12 VOLT.
HANSON - VAN WINKLE - MUN-
NING.

1—1500/750 AMPERE, 12/24 VOLT.
CHANDEYSSON, Synchronous.

ANODIZERS

1—1000 AMPERE, 40 VOLT. CHAN-
DEYSSON, 25°C.

1—1000 AMPERE, 30 VOLT. IDEAL,
Exciter-in-head.

1—750 AMPERE, 60 VOLT. HANSON-
VAN WINKLE-MUNNING, Syn-
chronous, Exciter-in-head.

1—500 AMPERE, 25 VOLT. CHAN-
DEYSSON, Synchronous, Exciter-in-
head.

4—400 AMPERE, 40 VOLT. M.G.C.,
Separately Excited.

RECTIFIERS

1—G. E. 2000/1000 AMP., 6/12 V.
1—SEL-REX SELENIUM, 1200 AMPS.
9 V. for 440/3/60.

1—1500/750 AMPERE 6/12 VOLT,
UDYLITE-MALLORY.

4—1440/720 AMPERE, 6/12 VOLT,
UDYLITE-MALLORY.

1—RAPID 1000 AMPERE, 12 VOLTS
Germanium, 440/3/60.

1—RAPID 750 AMP. 6 VOLT SELENIUM
REMOTE CONTROL, 440/3/60 AC.

SPECIAL

2—CROWN & H-VW-M Centrifugal
Driers No. 1 and No. 2 with Heat.

1—HAMMOND VRO-7 Variable Speed
Buffing Lathe, 7½ H.P.

1—H-VW-M Semi-Automatic for Cyan-
ide, 15 ft. x 60 in. x 42 in.

2—RONCI Enamellers, Nos. R-100 &
R-200.

1—UDYLITE Semi-Automatic for nick-
el, 18 ft. x 42 in. x 40 in. deep.

2—No. 101 Production Pipe Polishing
Machines.

1—No. A-2 ACME semi-automatic 2
spindle buffing head.

4—L'HOMMEDIU 5 HP Variable Speed
Buffing Lathes.

Other outstanding values in stock.
You'll save more if you check M. E.
Baker first for all your plating, anodiz-
ing and metal finishing needs.

M. E. BAKER CO.

Kirkland 7-5460

25 Wheeler St., Cambridge 38, Mass.

QUALITY EQUIPMENT

PRICED RIGHT AND READY
FOR IMMEDIATE DELIVERY

PLATING EQUIPMENT

30 Plating Barrels: Crown — Udylite —
HVWM — various sizes.

4 Industrial Filter Units; Model RDR2
Rubber lined with slurry tanks for nickel
solution; 2000 gal. per hr. motor AC 3 ph.
size 18x48 complete.

6 Semi-Automatic Plating Tank Units: Udy-
lite 20' — HVWM 20' — Crown 35' —
U. S. Galvanizing 12', 16' and 20'.

1 HVWM 4 station Plating Barrel Unit:
36x14; rubber lined tank, rubber cylinders.

4—Industrial RDR2 rubber lined filters &
slurry tanks. 4500 gal. per hr. Sizes 36-36-
30 with AC 3 ph. motor complete.

3 Blakeslee Niagara Single Stage Motor
Driven conveyor washers 8' long with 18"
wide belt.

10-Mears Kane Ofeldt gas fired steam
tubular boilers. 2-20 HP with pump units.

10 Centrifugal Dryers: acid crocks, motor
driven exhaust fans, fume blowers, complete
acid and dip rooms, cleaning and washing
tanks, plating racks and many other items.

30 Rubber lined Nickel Plating Tanks: 2' to
12' long; with rods, rheostats, motor driven
tank rod agitators, heating coils, etc.

16 DETREX, BLAKESLEE, CIRCO, Steam,
Gas and Electrically Heated Degreasers: 3'
to 6' long, single dip and 3 dip type, with
pumps, tanks, fume ducts.

12 STEINER IVES and GEHRNICH Paint
Baking and Drying Ovens: electric, all
sizes; full automatic, recirculating type with
controls, fans, blowers.

CHANDEYSSON: 1000 amps to 5000 amps.

HVWM: 500 amp. - 5000 amp.

HOBART: 100 amp. - 2000 amp.

COLUMBIA: 1000 amp. - 4000 amp.

BOGUE ELECTRIC: 500 amp. - 3000 amp.

AMERICAN GIANT: 250 amp. - 4000 amp.

ANODIZERS: 5 to 40 volts; 100-3000 amps.
all above complete with motors, panel
board, starting equipment; separately ex-
cited, interpole type.

ALL SIZES — TUMBLING BARRELS: Ab-
bott — Baird; complete with stones and
steel balls.

ALL EQUIPMENT IN STOCK
INSPECTION INVITED

All quoted subject to prior sale.

J. HOLLAND & SONS, INC.

485 KEAP ST. • BROOKLYN 11, N. Y.

STagg 2-2022

ADVERTISING RATES

Per column inch per insertion

1 time	\$12.00
3 times	11.00
6 times	10.00
Yearly (12 times)	9.00

READY REFERENCE SECTION

CLEANING • POLISHING AND BUFFING • ELECTROFORMING
ANODIZING • RUSTPROOFING • PLATING • BARREL FINISHING
VACUUM METALIZING • LACQUERING AND ENAMELING

USED... NOT ABUSED EQUIPMENT

ALL OF THE EQUIPMENT LISTED BELOW IS FULLY RECONDITIONED AND GUARANTEED

IN STOCK

POWER EQUIPMENT

- 1—Chandeysson motor generator set 1000 amps. 6 volts.
- 1—American Giant 750 amps. 6 volts
- 3—Udylite rectifiers 1500 amps. 6 V, 750 amps. 12 V.
Richardson-Allen 1000 amps. 6 V. with control.
G. E. 500 amps. 6 volts.
Rapid 300 amps. 6 volts with control.
Richardson-Allen 150 amps. 6 V., 75 amps. 12 V. with control.
G. E. 2000 amps. 6 volts with control.
G. E. 1000 amps. 6 volts with control.

SEMI-AUTOMATIC PLATING MACHINES

- 1—Hanson-Van Winkle-Munning 32' x 5 x 4 steel.
- 1—Hanson-Van Winkle-Munning 25' x 5 x 4 rubber lined.
- 1—U. S. Galvanizing 16 x 2 1/2 x 2 1/2 rubber lined.

PLATING BARRELS

- 1—Lasalco steel 36 x 18 lucite cylinder.
- 1—Lasalco rubber lined 30 x 15.
- 1—Hanson-Van Winkle-Munning steel 36 x 18.
- 2—Udylite multi-purpose barrel — hard rubber cylinder.
- 1—Belke oblique plater.

FILTERS

Industrial, Alsop, Sethco — all sizes — nickel and cyanide solutions.

TUMBLING BARRELS

- 1—Belke oblique barrel model #2H — like new.
- 3—Baird barrels.
- 4—Henderson barrels.
- 4—Globe barrels.
Holland barrels.

POLISHING MACHINES

- 1—Production Machine #101 — 7 1/2 H.P.
- 1—Production Machine #484-2.
- 1—L'Hammedieu 5 H.P. variable speed.
- 1—Divine 5 H.P. variable speed.
- 10—Holland 5 H.P.
Gardener 5 H.P. — 7 1/2 H.P.
- 5—Holland 7 1/2 H.P.

DRYERS

- 2—Barrett centrifugal dryers.
- 1—Hanson-Van Winkle-Munning centrifugal dryer.

BOILERS

Kane gas fired 20 H.P., 7 1/2 H.P.

RHEOSTATS — all sizes

MISCELLANEOUS

- 1—Philips electric degreaser.
- Blowers and motors — multi vain fume peddle wheel dust.

TANKS

300—All sizes — all linings.

LINDALE

EQUIPMENT AND SUPPLY CORP.

504 SMITH ST., BROOKLYN 31, N. Y.

Phone: TRiangle 5-4353

PLATERS AND ANODIZERS

M-G SETS — Motor 3-60-220/440

Amp.	Volt	Make
175	14	Delco
200	7 1/2	Chandeysson
200A	80/90	Reliance
200	7 1/2	Hobart
300	7 1/2	Hobart
400	60/60	G. E.
417	60	Elec. Prod.
940	32	Elec. Prod.
1000/500	6/12	Chandeysson
1500/750	6/12	H.V.W
1500	15	Star
1500	30/50	Century
1500	40/65	G. E.
1500	65	Westinghouse
1500	70	Century
2500/1250	6/12	Elec. Prod.
5000/2500	6/12	Chandeysson
5000/2500	6/12	Columbia
5000/2500	9/18	Chandeysson

SHUNTS

5,000 Amp., 50 mv.
6,000 Amp., 50 mv.
10,000 Amp., 50 mv.
15,000 Amp., 50 mv.

MOTOR REPAIR & MANUFACTURING CO.

1555 HAMILTON AVE., CLEVELAND, OHIO

FOR SALE

Slightly Used

BUFFS

Loose and Sewed

Any Quantity

MICHIGAN BUFF CO., INC.

3503 GAYLORD AVENUE

DETROIT 12, MICHIGAN

PAINT STRAINERS

FOR STRAINING LACQUERS, ENAMELS, PAINTS OR VARNISHES.



Made of heavy paper stock with cloth inserts in coarse, medium, fine or extra fine mesh. 6" in diameter.

LOUIS M. GERSON CO.

BOX 175-F

MATTAPAN, MASS.

FOR SALE

SURPLUS PLATING EQUIPMENT

Silver and hard chrome plating department (less generators) complete with blowers, rheostats and the following tanks:
3—Cleaning tanks 4' x 3' x 3' deep.
8—Rinse tanks 3' x 3' x 3' deep.
3—Koroseal lined tanks 3' x 3' x 3' deep.
3—Koroseal lined tanks 3 1/2' x 3 1/2' x 3' deep.
6—Rubber lined tanks 3' x 3' x 3' deep.

- 1—Stevens fully automatic Model A continuous nickel plating machine (less generator) 33' center, 25 stations, complete with tanks.

- 1—Acme rotary buffing machine, 10' diameter, 8 stations including drive and indexing motors, 3 phase, 60 cycle, 220 volt.

- 16—Rubber lined tanks assorted sizes—From 4' long x 3' wide x 3' deep to 18' long x 4 1/2' wide x 6' deep.

- 1—70 B. F. Stuertervant exhaust blower, 25 1/2" intake and outlet.

- 1—Chandeysson Generator — 6 Volt — 1500 Amps.

- 1—Chandeysson Generator — 6 Volt — 1500 Amps.

- 1—Exciter Westinghouse — 230 Volts — 5.7 Amps. R & L hand Draf Box & Draf Collector.

AUTO CITY PLATING COMPANY

197 SOUTH WATERMAN STREET

DETROIT 17, MICHIGAN

PHONE: VINEWOOD 1-8300



IDEAL TACK RAGS

For a Perfect Finish
Bulk or Bagged

IDEAL CHEMICAL COMPANY

1499 Dean Drive
So. Euclid 21, Ohio

BUSINESS OPPORTUNITIES

ALUMINUM FABRICATING on east Florida coast. Fabulous city, unlimited opportunity. Valuable real estate and first class equipment and building. Net \$35,000. Write B10025.

MACHINE SHOP in central west Texas. Established 1939, steady clientele. Rich oil-farm region. Asking price \$19,000 including valuable corner real estate and \$12,000 equipment. Write B10048.

IRON CRAFT SHOP in central east Florida. Interesting and extensive ornamental items. Large demand. Good central location. Ask \$9,000 for equipment and fixtures. Write B-10095.

METAL HEAT TREATING, two plants in southern U. S. Well established, founder offering both at \$650,000. Terms. Write B10115.

SHEET METAL CO. in central Indiana. Good location, new, modern building. Large clientele. Commercial trade. Excellent opportunity. Ask \$40,000. Write B-62515.

PROPRIETARY STEEL PRODUCT. To be moved. All figs. fixtures, dies, inventory, patents, etc. 800 national dealer list. For details write B62530.

BUSINESS MART OF AMERICA

5723 Melrose Ave.

Los Angeles 38, Calif.

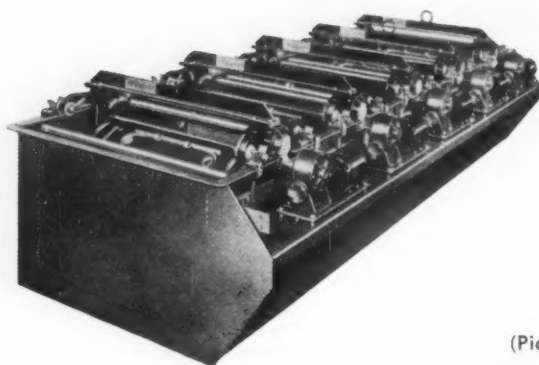
INTER-OFFICE COMMUNICATION

TO: BOB

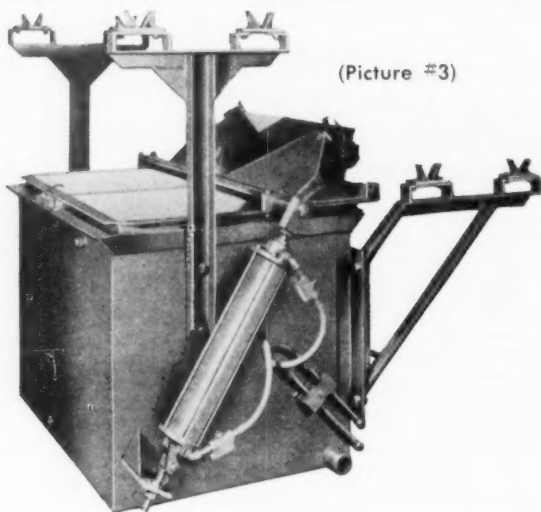
Let's go, Brother, move some of this barrel equipment
CHEAP, instead of saving it for our children's posterity.

STEVE

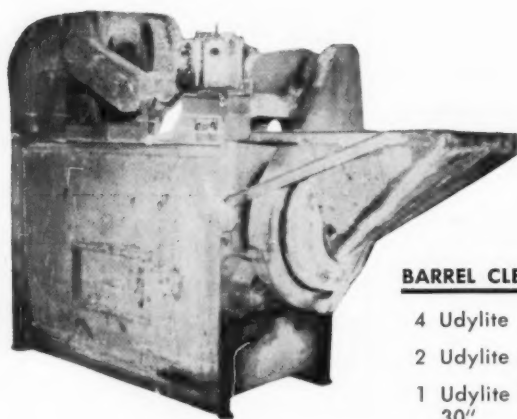
(Picture #1)



(Picture #3)



(Picture #2)



BARREL PLATING

(Picture #1)

- 1 Udylite 4 comp. Nickel Unit 30"
- 3 Udylite 3 comp. Cyanide Units 30"
- 5 Udylite 2 comp. Cyanide Units 30"
- 10 Udylite Single comp. Cyanide Units 30"
- 5 Udylite Single comp. Nickel Units 30"
- 2 Udylite Single comp. Nickel Units 36"
- 5 Udylite Single comp. Cyanide Units 36"
- 22 Udylite complete Bakelite and Hard Rubber Cylinders 30 & 36"
- 18 Udylite Lucite Cylinders for full cycle 30 & 36"

DRYING

- 2 Blakeslee Hot Air Dryers (Picture #2)
- 8 Crown 12 x 12 Centrifugal Dryers with steam heat
- 5 Kreider Centrifugal Dryers with steam heat
- 1 Mercil 18 x 18 Centrifugal Dryer with steam heat

BARREL CLEANING

- 4 Udylite 14 x 30 Monel Cylinders
- 2 Udylite 14 x 36 Monel Cylinders
- 1 Udylite Triple Unit Cleaner Tank 30"
- 1 Udylite Double Unit Acid Tank 30"
- 10 Udylite Cold Water Rinse Tanks 30 & 36"
- 5 Udylite Single Air Operated Chute type Transfer Units (Picture #3)
- 10 Udylite Single Air Operated Chutes
- 5 Udylite Standard Chute type Rinses

BAKER BROS., INC.

564 EAST FIRST ST., SOUTH BOSTON 27, MASS. TEL. ANDREW 2-2535

WE HAVE ONE OF THE LARGEST AND MOST DIVERSIFIED LINES OF EQUIPMENT IN THE COUNTRY.

ADVERTISING RATES

Per column inch per insertion	
1 time - - -	\$12.00
3 times - - -	11.00
6 times - - -	10.00
Yearly (12 times)	9.00

READY REFERENCE SECTION

CLEANING • POLISHING AND BUFFING • ELECTROFORMING
ANODIZING • RUSTPROOFING • PLATING • BARREL FINISHING
VACUUM METALIZING • LACQUERING AND ENAMELING

PRICED RIGHT FOR QUICK SALE

POWER EQUIPMENT

1—Richardson	25 Amperes	6 volts
1—Hobart	200 Amperes	7 1/2 volts
1—G. E.	300 Amperes	6 volts
3—G. E.	500 Amperes	6 volts
1—Richardson	500 Amperes	6 volts
1—Rapid	500 Amperes	6 volts
4—Udylite	750 Amperes	24 volts
2—Udylite	750 Amperes	48 volts
1—Richardson	1000 Amperes	6 volts
4—Udylite	1500 Amperes	12 volts
2—Udylite	1500 Amperes	24 volts
1—Udylite	1500 Amperes	48 volts
1—Rapid	2000 Amperes	6 volts
2—Udylite	3000 Amperes	12 volts
1—Chandeysson	3000 Amperes	12 volts
1—Udylite	3000 Amperes	24 volts
2—Rapid	6000 Amperes	6 volts
1—Udylite	6000 Amperes	12 volts
1—Chandeysson	6000 Amperes	6 volts
1—Rapid	12000 Amperes	6 volts

MISCELLANEOUS EQUIPMENT

- 1—Tollhoist Dryer.
- 3—Degreasers — Blakeslee, Detrex & Phillips.
- 1—Periodic Reverser 250 amperes.
- 6—Temperature Regulators, Powers, Sarco.
- 2—Industrial Filters acid and cyanide.

Specialists in Plant Engineering, Consultation, Analysis and Layout — Anodizing our specialty.

TANKS — ALL SIZES AND LININGS

New Rectifiers — 25 Amperes to 10,000 Amperes.
Airbuffs — Compounds — Anodes — Chemicals, etc.
For Dependability & Service call on:

BRUCAR EQUIPMENT & SUPPLY CO.

WAREHOUSE: 602-604 - 20TH STREET BROOKLYN 18, N. Y.
Telephone: STerling 8-0236 - 7 - 8

PLATING GENERATORS FOR SALE

- 2—15000/7500 Amp. 9/18 Volt, Chandeysson Motor Generator Sets, with Direct Connected Exciters, Panels and Starters. (1947 Machines) 180 RPM, Like New Condition.
- 2—10000/5000 Amp. 9/18 Volt, Chandeysson Motor Generator Sets, with Direct Connected Exciters, Panels and Starters. (1943 Machines) 300 RPM, Excellent Condition.
- 1—8000 Ampere, 18 Volt, Chandeysson Motor Generator Set, with Direct Connected Exciter, Panel and Starter. (1946 Machine) 300 RPM, Equal to New Condition.

Note: All above MG Sets are factory-built, Synchronous Driven, 440 or 220 Volt, 60 Cycle, 3 Phase. Location Mid-West Shipping Point. Priced Right — IMMEDIATE shipment.

ALAN BAKER COMPANY

180 Sylvester Road

South San Francisco, Calif. Plaza 5-6506

EQUIPMENT FOR SALE

Wagner full automatic cadmium or zinc plating machine, capacity 1500 gals. with maximum 100 racks per hour, also double cleaning cycle. This machine was installed in our plant Nov. 1956 and used a total of 250 hours. Condition is perfect, can be purchased with or without 5000 amp. Clinton rectifier and full controls which was purchased in July 1957. For further information write to May 1, care Metal Finishing, 381 Broadway, Westwood, N. J.

If You Don't Need Any Additional Metal Finishing Equipment Congratulations: IF YOU DO, WHY NOT CALL OR WRITE US?

POWER EQUIPMENT

- 6—G. E. 6 v. 500 ampere units w/new selenium stacks \$325.00.
- 3—Rapid, Green 500 ampere units with controls.
- 1—Rapid 6 V. 750 ampere unit.
- 1—Rapid 24/48 v. 4000/2000 ampere with new Germanium or Selenium stacks.
- 1—Chandeysson MG set 6000/3000 amp. 6/12 v. 300 R.P.M. complete.
- 1—Bogue MG set 5000/2500 amp. 6/12 v.
- 1—Jantz-Leist 1600/850 amp. 12/24 v.
- 1—G. E. 1500 amp. 6 v. MG set.
- 1—Bogue Generator 3500/1750 amp. 6/12 v.
- 1—H. V. W. 6000/3000/1500 amp. 6/12/24 v.
- 6—1500 amp. 6 v. rectifiers Udylite 750 amp. 12 v.
- 1—Control for 4—Udylites.
- 1—1000 amp. Hobart M.G. set, outside ext.
- 1—Chandeysson MG set 6 volts.
- 1—60 v. 750 amp. Star-Kimbal MG set.
- 1—Rapid 2000/1000 amp. 48/24 volt with new selenium stacks.
- 1—Green 1000 ampere 6 v. rectifier.
- 1—Lewis 1000 ampere 6 v. rectifier.
- 1—Electric Products 400 amp. 24 v.
- 3—G. E. 2000/1000 ampere 6/12 volts Rects.
- 2—G. E. Controls 6/12 6000/3000 Saturable Core Rectifiers.
- 1—H. V. W. 5000/2500 6/12 v. Synchronous M/G Set w/controls.

AUTOMATIC POLISHING EQUIPMENT

- 1—75" Straight Line Extrusion & Rectangular Tubing Polishing Machine w/10 heads, 7-10 H.P. and 3-5 H.P.
- 5—Acme GI Universal Heads.
- 31—Murray Way #55 & 60 Heads & Belts Sanders.
- 11—Acme G-3 144" Belt Sanding Machines.
- 2—Acme L-8-L fully automatic polishing machines 8 spindles, each machine comp. w/5, 3, 2 H.P. polishing heads.
- 2—Acme A-2.

PLATING BARRELS

- Complete Line Lasaleo 14" x 42" cleaning, plating, rinsing, melamine barrels.
- 1—Daniels #28.
- 1—Stevens 6 barrel 20' horseshoe type semi-automatic w/8 extra new barrels.
- 3—24 Daniels Rubber Lined.
- 1—Daniels #2 Rubber Lined w/Lucite Cylinder.
- 1—Reidel Chroma Plating Barrel, complete.

POLISHING MACHINES

- 5—5 H.P. Divine Pol. Mash. also 7 1/2 & 10 H.P.
- 5—Gardner 3C Polishing Lathes, single & double, 5, 7 1/2 & 10 H.P.
- 3—Hammond Double 5 H.P. lathes.
- 1—Hisey Wolf 5 H.P. var. speed pol. mach.
- 1—U.S. #55 var. speed 5 H.P. pol. mach.
- 1—L'Hommedieu Vari-Speed 5 H.P.
- 15—Pesco & Pesco type 3-5-7 1/2 H.P. pol. lathes. New Pesco 5 H.P. \$65.00, 7 1/2 H.P. \$445.00.
- 1—H. V. W.-DMI, 5-7 1/2 or 15 H.P.
- 2—Hammond 7-RRWB, Double 7 1/2 H.P. Heavy Duty.
- 1—Hammond 5 H.P. VRRD.

TUBE POLISHING EQUIPMENT

- 1—101 Tandem 15 H.P.
- 1—101 Production 10 H.P.
- 1—Hammond QD-8 10 H.P.
- 2—Type "A" production tube polishers, up to 6" tubing.
- 1—Type "S" Production tube polisher, up to 1 1/4" tubing.

FILTERS

- 1—Industrial RDR-2 3' x 5'.
- 7—Industrial Rubber lined 10 x 22, 10 x 28, 14 x 36.
- 8—Also WR&NR 5" & 7" steel & stainless steel.
- 1—RDR-2-30x36x30.

Various other makes and models.

DRYING EQUIPMENT

- 1—Place 12" Centrifugal.
- 1—Kreider 12" Centrifugal.

TUMBLING EQUIPMENT

- 2—Crown #452 2 Comp. neoprene lined 5 H.P. vari-drive.
- 2—New Lasaleo Tumbling Type.
- 2—Almeo 32" x 32" 2 comp.
- 6—Abbetts 8" x 30", 16" x 36" single & double belt & motor driven.
- 7—Baird #1 stands motor driven.
- 2—Globe Tumbling Barrels.
- 2—Henderson #25 & 5A tumbling barrels.
- 2—22 Lasaleo Burnishers.

DEGREASERS

- 1—28' Detrex conveyorized.
- 1—15' Barrel type degreaser.
- 16—Degreasers 14" to 7", all makes, gas, steam, electric.
- 2—Phillips Ferris Wheel.

TANKS

- 380—Stainless Steel, Steel, Brick, Lead & Rubber Lined, all sizes.

MISCELLANEOUS

- 1—Gas Baking Oven 78" high, 72" deep, 36" wide 1.0 w/controls & trucks.
- Many other makes, & models, of ovens.
- 1—Wheelabrator—Model BM75300.
- 1—12' x 7' x 7" Oven.

PESCO PLATING EQUIPMENT CORP.

SURPLUS EQUIPMENT AND COMPLETE PLANTS PURCHASED

Plating, Polishing, Grinding, Spraying, Baking, Drying, Tumbling, Cleaning, Degreasing & Anodizing Equipment.
Anodes, Chemicals, Acids, Cyanides, Solvents, Supplies for Wood, Plastic and Metals.

75 WYTHE AVENUE

EVERgreen 4-7472 - 3 - 4

BROOKLYN 11, NEW YORK

ADVERTISING RATES

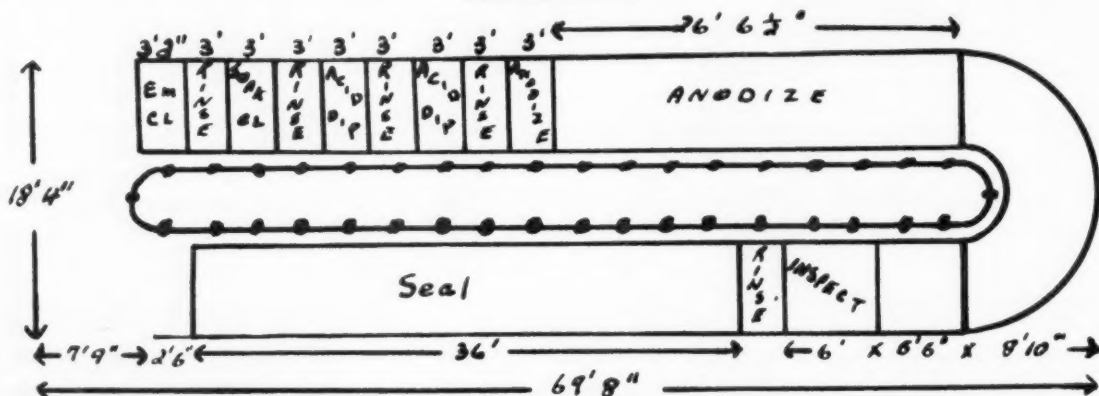
Per column inch per insertion	
1 time	\$12.00
3 times	11.00
6 times	10.00
Yearly (12 times)	9.00

READY REFERENCE SECTION

CLEANING • POLISHING AND BUFFING • ELECTROFORMING
ANODIZING • RUSTPROOFING • PLATING • BARREL FINISHING
VACUUM METALIZING • LACQUERING AND ENAMELING

70' H-VW-M ELEVATOR FULL AUTOMATIC UNIT

Year Built 1951



UNIT NOW SET UP FOR AUTOMATIC ANODIZING BUT CAN EASILY BE CONVERTED TO ANY OTHER TYPE OF PLATING (NICKEL & CHROME, CADMIUM, ZINC, ETC.). TANKS 5' Deep x 5' 6\". Length of Travel Varies.

Knocked Down Ready For Shipment

FOR AUTOMATIC POLISHING OR PLATING EQUIPMENT CALL OR WRITE

PESCO PLATING EQUIPMENT CORP.

Plating, Polishing, Grinding, Spraying, Baking, Drying, Tumbling, Cleaning, Degreasing & Anodizing Equipment.
Anodes, Chemicals, Acids, Cyanides, Solvents, Supplies for Wood, Plastic and Metals.

75 WYTHE AVENUE

Evergreen 4-7472 - 3 - 4

BROOKLYN 11, NEW YORK

BLAKESLEE DEGREASER

Model V5V Single Monorail Blakeslee Degreaser Complete with #4 Still

26'6\" Overall Length
6'9\" Overall Width
13'4\" Overall Height
Richard-Wilcox Single Rail Conveyor
12\" x 12\" x 40\" Work Rack
290 Gallons Solvent Capacity
Vapor-Spray-Vapor Type

440 Volt - 60 Cycle - 3 Phase Motor
4,500 Lbs/Hr Work Capacity
375 Gallon Storage Tank
60-120 Gals/Hr Still Capacity
Exhaust Fan and Motor
3/16\" Tank Material - 15% Nickel Clad

Original Cost — \$11,307.00. Will Sell for \$6,500.00. Available for Inspection.
Machine Is In Excellent Condition, and Is Slightly Used.

NATIONAL LOCK COMPANY — ROCKFORD, ILLINOIS

WANTED

PLATING SHOP

Netting \$15,000 up

Address: May 8, care Metal Finishing,
381 Broadway, Westwood, N. J.

45th ANNUAL CONVENTION OF THE A. E. S.

MAY 19 — 22, 1958

CINCINNATI BRANCH — HOST

CINCINNATI, OHIO

ADVERTISING RATES		
Per column inch per insertion		
1 time	-	\$12.00
3 times	-	11.00
6 times	-	10.00
Yearly (12 times)	-	9.00

READY REFERENCE SECTION

CLEANING • POLISHING AND BUFFING • ELECTROFORMING
ANODIZING • RUSTPROOFING • PLATING • BARREL FINISHING
VACUUM METALIZING • LACQUERING AND ENAMELING

SOLVENTS & THINNERS RECOVERED

from

SLUDGE • WASTE • WASH •
SPOILED LACQUERS, Etc.

HAMMOND SOLVENTS RECOVERY SERVICE

241 Brunswick St. Hammond, Ind.
Phone: Sheffield 5241



WORTHY STRAINER

•
STRAINS PAINTS
AND VARNISHES
AS YOU SPRAY
•

Consult Your Paint
Dealer or Order
Direct From Factory
in Lots of 12

Price \$1.50 Ea.

WORTHY PRODUCTS CO.
Box 3415 St. Paul 1, Minn.
Send For Literature

Bound Volumes now available
for 1957

Price \$10.00

Also a limited number of other
previous years back to 1953.

For complete list and prices, write:

METAL FINISHING

381 BROADWAY WESTWOOD, N. J.

SITUATIONS OPEN

BUFFING COMPOUND SALESMEN

SITUATION OPEN — Distributors, jobbers
and manufacturers agents wanted to distribute
and sell the full line of Schaffner's polishing
and buffing composition in bar, spray or paste
form, and a complete line of polishing room
supplies.

SCHAFFNER MANUFACTURING COMPANY,
INC.
Emsworth, Pittsburgh 2, Pa.

BUFF LINE WANTED

Old established Supply House in England manufac-
turing polishing compositions and buffs in addition
to usual metal finishing equipment such as salts,
solutions, anodes, etc., wishes to enter into agree-
ment with reputable American manufacturer who
would be prepared to grant a license for the manu-
facture and distribution in Great Britain of ventila-
ted and similar type buffs. Please communicate in
first instance. Address: May 2, care Metal Finish-
ing, 381 Broadway, Westwood, N. J.

SALESMEN

Distributors, jobbers and manufacturers' agents, with
metal finishing contacts preferred, to distribute and
sell the complete line of McAleer's polishing and
buffing compounds in spray, paste and extruded bars.
Write or phone:

McALEER MANUFACTURING CORP.
101 S. Waterman Detroit 17, Mich.
Vinewood 3-5970

RESEARCH CHEMIST or CHEMICAL ENGINEER

SITUATION OPEN—A man of ability
and initiative is required for research
and development of metal finishing
specialties by a progressive, reputable,
expanding national organization. A
challenging, interesting position is of-
fered to one capable of working without
detailed supervision. Liberal profit shar-
ing and retirement benefits. Suburban
New York location. Reply in detail.
Address: April 5, care Metal Finishing,
381 Broadway, Westwood, N. J.

PLATER

SITUATION OPEN—Well established Columbus,
Ohio company seeking man experienced in silver re-
plating of holloware, etc. Must know gold, copper,
nickel, brass and chrome plating and be able to
supervise polishing department. Excellent opportunity
for ambitious man. Submit experience resume. Ad-
dress: May 3, care Metal Finishing, 381 Broadway,
Westwood, N. J.

CHEMIST

SITUATION OPEN—Experienced in research
for development work in buffing and polish-
ing compositions. Mid-west location. In reply
give complete background. Address: April 3,
care Metal Finishing, 381 Broadway, West-
wood, N. J.

DISTRIBUTORS WANTED

for South and Southwest. Long established
manufacturer of metal cleaning, burnishing,
deburbing, aluminum treating, and related
compounds seeking connections with reputable
distributors. Address: May 4, care Metal Fin-
ishing, 381 Broadway, Westwood, N. J.

TECHNICAL DIRECTOR

SITUATION OPEN—Medium size shop, vicinity New
York City. Burnishing, copper barrel plating, nickel
barrel plating and gold barrel plating of small parts.
To be in complete charge of time study, work flow
analysis, quality control and price estimates. Salary
\$9,000 to start. Advancement to assistant general
manager and eventually to general manager. Address:
October 6, care Metal Finishing, 381 Broadway,
Westwood, N. J.

ELECTROPLATING SUPERINTENDENT

SITUATION OPEN—Man wanted by small
job shop in Boston specializing in plating on
electronic components. Must be able to super-
vise a small crew and maintain solutions. State
qualifications in first letter. Address: May 5,
care Metal Finishing, 381 Broadway, West-
wood, N. J.

DISTRIBUTORS WANTED

Top manufacturer of nickel salts expands pro-
duction facilities allowing appointment of ad-
ditional distributors for additional territories.
Bonafide distributors to the Metal Finishing
Industry please write, giving scope of cover-
age and other influencing factors, to Box
April 1, care Metal Finishing, 381 Broadway,
Westwood, N. J.

TECHNICAL SALES REPRESENTATIVE

SITUATION OPEN—Leading eastern
manufacturer of cleaning, burnishing,
deburbing, aluminum treating and re-
lated compounds, with distributorship
of complete line of plating equipment
and supplies, offers excellent opportu-
nity to ambitious man under 35. Terri-
tory available includes Maryland, Dela-
ware and part of south-central Pennsylv-
ania. Send complete resume. Address:
May 7, care Metal Finishing, 381
Broadway, Westwood, N. J.

CORROSION COATINGS SALESMAN

SITUATION OPEN—We are interest-
ed in obtaining the services of a man
preferably with sales and service expe-
rience in the anti-corrosion coating field
to represent us in the greater New York
area. Our line of outstanding Copon
coatings offers an excellent opportunity
for the right man. Address reply in con-
fidence to Ray H. Sommer, giving full
details including salary desired.

BROOKLYN PAINT & VARNISH CO., INC.
50 Jay St. Brooklyn 1, New York

INDUSTRIAL CLEANING CHEMIST

SITUATION WANTED—Young, ag-
gressive specialist in metal and all
phases of industrial cleaning, also allied
chemical specialties; experienced in
formulation, development, sales, service,
management, production supervision
and purchasing. Address: May 6, care
Metal Finishing, 381 Broadway, West-
wood, N. J.

SUPPLIERS OF EQUIPMENT AND MATERIALS AND ADVERTISERS INDEX

Abbey Process Automation, Inc.	57	Formax Mfg. Corp.	138	Mutual Chromium Chemicals,	17
37-01 48th Ave., Long Island City 1, N. Y.		3171 Bellevue, Detroit 7, Mich.		Solvey Process Div.	
Agate Lacquer Mfg. Co.	143	G. S. Equipment Co.	38, 56	61 Broadway, New York 6, N. Y.	
11-13 43rd Rd., Long Island City 1, N. Y.		15585 Brookpark Rd., Cleveland 10, Ohio		Nankervis Co., Geo. L.	52
Alert Supply Co.	147	General Electric Co.	58, 59	15300 Fullerton Ave., Detroit 27, Mich.	
2041 Davie Ave., Los Angeles, Calif.		Schenectady 5, N. Y.		Nazar Rubber Co., The	151
Allied Research Products, Inc.	12	Gerson Co., Louis M.	155	2727 Avondale, Toledo 7, Ohio	
4004 E. Monument St., Baltimore 5, Md.		Box 175-F, Mattapan, Mass.		Neilson Chemical Co.	141
Alvey-Ferguson Co.	137	Glo-Quartz Electric Heater Co., Inc.	129	2300 Gainsboro, Ferndale 20, Mich.	
500 Disney St., Cincinnati 9, Ohio		Willoughby, Ohio		Ookite Products, Inc.	4
American Brass Co.	118, 119	Globe Chemical Co., Inc. The	143	18 Rector St., New York 6, N. Y.	
Waterbury 20, Conn.		Cincinnati, Ohio		Packer Machine Co.	127
American Buff Co.	10, 11	Graver Water Conditioning Co.	42	456 Center St., Meriden, Conn.	
2414 S. LaSalle St., Chicago 16, Ill.		216 W. 14th St., New York 11, N. Y.		Park Chemical Co.	150
American Metal Climax, Inc.	35	Guaranteed Buff Co., Inc.	151	8074 Military Ave., Detroit 4, Mich.	
61 Broadway, New York, N. Y.		20 Vandam St., New York 13, N. Y.		Pennsalt Chemicals Corp.	130, 131
American Platinum & Silver Div.,		Gumm Chemical Co., Inc., Frederick		3 Penn Center Plaza, Philadelphia 2, Pa.	
Engelhard Industries, Inc.	18	538-542 Forest St., Kearny, N. J.		Pesco Plating Equipment Corp.	157, 158
231 New Jersey R. R. Ave., Newark 5, N. J.		Hamilton Emery & Corundum Co.	152	75 Wythe Ave., Brooklyn 11, N. Y.	
Ampco Metal, Inc.	142	Chester, Mass.		Pfizer & Co., Inc., Chas.	49
Milwaukee 46, Wisc.		Hammond Machinery Builders, Inc.	109	630 Flushing Ave., Brooklyn 6, N. Y.	
Apothecaries Hall Co.	24	1601 Douglas Ave., Kalamazoo 54, Mich.		Plating Products, Inc.	139
22 Benedict St., Waterbury 20, Conn.		Hammond Solvents Recovery Service	159	1509 N. Washington, Kokomo, Ind.	
Atlantic Compound Co.	111	1858 Baldwin St., Waterbury, Conn.		Promat Div., Poor & Co.	40
1858 Baldwin St., Waterbury, Conn.		Henderson Bros. Co.	115	851 S. Market St., Waukegan, Ill.	
Atlas Mineral Products Co.	120	82 Fulton St., New York 38, N. Y.		Randolph Products Co.	149
Mertztown, Pa.		Hanson-Van Winkle-Munning Co.	104A-D	92 N. 12th St., Carlstadt, N. J.	
Bacon Felt Co.	48	Matawan, N. J.		Rapid Electric Co.	9
437 W. Water St., Taunton, Mass.		Hardwood Line Mfg. Co.	33	2881 Middletown Rd., Bronx 61, N. Y.	
Baird Machine Co.	135	2022 N. California Ave., Chicago 47, Ill.		Raybestos-Manhattan, Inc.	133
Stratford 9, Conn.		Harshaw Chemical Co., The	14, 15	Manhattan Rubber Div.	
Baker Bros., Inc.	156	1945 E. 97th St., Cleveland 6, Ohio		Passaic, N. J.	
564 E. First St., So. Boston 27, Mass.		Henderson Bros. Co.	114	Reynolds Chemical Products Co.	122
Baker Co., Alan	157	136 S. Leonard St., Waterbury, Conn.		1200 N. Main St., Ann Arbor, Mich.	
180 Sylvester Rd., South San Francisco, Calif.		Holland & Sons, Inc., J.	154	Richardson-Allen Corp.	65
Baker Co., The M. E.	154	485 Keap St., Brooklyn 11, N. Y.		116-15 Fifteenth Ave., College Point, L. I., N. Y.	
25 Wheeler St., Cambridge 38, Mass.		Hooker Electrochemical Co.	22	Saran Lined Pipe Co.	31
Barker Bros., Inc.	136	1303 Union St., Niagara Falls, N. Y.		2415 Burdette Ave., Ferndale 20, Mich.	
1660 Summerfield St., Brooklyn 27, N. Y.		Hull & Co., Inc., O.	51	Schori Process Div., FerroCo Corp.	40
Battelle Development Corp.	34A, B	1301 Parsons St., Rocky River 16, Ohio		8-11 43rd Rd., Long Island City, N. Y.	
Columbus 1, Ohio		Ideal Chemical Co.	155	Sel-Rox Corp.	
Beam-Knodel Co.	147	1499 Dean Dr., So. Euclid 21, Ohio		Inside Back Cover	
195 Lafayette St., New York 12, N. Y.		Industrial Filter & Pump Mfg. Co.	26	75 River Rd., Nutley 10, N. J.	
Belke Manufacturing Co.	29	5906 Ogden Ave., Chicago 50, Ill.		Service Screw Products Co.	151
947 N. Cicero Ave., Chicago 51, Ill.		Infilco, Inc.	50	131 N. Green St., Chicago 7, Ill.	
Better Finishes & Coatings, Inc.	116	P. O. Box 5033, Tucson, Ariz.		Sethco Mfg. Co.	144
268 Doremus Ave., Newark 5, N. J.		Ionic Electronic Corp.	107	2286 Babylon Turnpike, Merrick, L. I., N. Y.	
Bias Buff Div., Riegel Textile Corp.	64	11 Monroe St., Garfield, N. J.		Siefen Co., J. J.	36
250 Madison Ave., New York 16, N. Y.		Jelco Finishing Equipment Corp.	46	5643 Lauderdale, Detroit 9, Mich.	
Block & Co., Inc., Wesley	65	153 E. 26th St., New York 10, N. Y.		Simonds Abrasive Co.	37
116-15 Fifteenth Ave., College Point, L. I., N. Y.		Karr & Co.	150	Tacony & Fraley Sts., Philadelphia 37, Pa.	
Branson Ultrasonic Corp.	136	923 E. Broad St., Columbus 5, Ohio		Solbern Mfg. Corp., Div. of Eisenberg	
21 Brown House Rd., Stamford, Conn.		Klem Chemicals, Inc.	132	Industrial Contracting Co.	63
Brucar Equipment & Supply Co.	157	14401 Lansing Ave., Dearborn, Mich.		120 13th St., Brooklyn 15, N. Y.	
602-604 20th St., Brooklyn, N. Y.		Kocour Company	62	Sommers Bros. Mfg. Co.	152
By-Buk Co.	145	4802 S. St. Louis Ave., Chicago 32, Ill.		3439 No. Broadway, St. Louis 7, Mo.	
4314 W. Pico Blvd., Los Angeles 19, Calif.		Kosmos Electro-Finishing Research, Inc.	134	Spee-Flo	126
Chemical Corp., The	146	140 Liberty St., Hackensack, N. J.		6614 Harrisburg, Houston 11, Texas	
58 Waltham Ave., Springfield, Mass.		Kraft Chemical Co.	153	Standard Plating Rack Co.	188
Ciba Co., Inc.	18A	917 W. 18th, Chicago 8, Ill.		1913-25 N. Paulina St., Chicago 22, Ill.	
627 Greenwich St., New York 14, N. Y.		Kramer Co., H. W.	122	Stevens, Inc., Frederic B.	41
Cleveland Process Co.	117	120-30 Jamaica Ave., Richmond Hill 18, N. Y.		1808 - 18th St., Detroit 16, Mich.	
1965 E. 57th St., Cleveland 3, Ohio		Kurhner, Dr. Joseph B.	152	Storitz Welding Co., Inc.	140
Clinton Co., The	34	Stroudsburg, Pa.		38 Stone St., Meriden, Conn.	
1220 Elston Ave., Chicago 22, Ill.		Lasalco, Inc.		Stutz Co., The	43
Clinton Supply Co.	47, 154	2820-38 LaSalle St., St. Louis 4, Mo.		4430 W. Carroll Ave., Chicago 24, Ill.	
112 S. Clinton St., Chicago 6, Ill.		Lea Mfg. Co.	52A, B	Surety Rubber Co.	141
Cohn Mfg. Co., Inc., Sigmund	64	16 Cherry Ave., Waterbury 20, Conn.		Carrollton, Ohio	
121 S. Columbus Ave., Mt. Vernon, N. Y.		Lea Michigan, Inc.	140	Syntron Co.	105
Conversion Chemical Corp.	44	14066 Stansbury Ave., Detroit 27, Mich.		Homer City, Pa.	
98 E. Main St., Rockville, Conn.		Lea-Ronal, Inc.	52C, D	Technic, Inc.	67
Copper Pigment & Chemical Works, Inc.	20	139-20 109th Ave., Jamaica 35, N. Y.		39 Snow St., Providence, R. I.	
217 Bayway, Elizabeth 2, N. J.		Leiman Bros., Inc.	144	Tranter Mfg., Inc.	16
Cowles Chemical Co.	125	105 Christie St., Newark 5, N. J.		Lansing 9, Mich.	
7014 Euclid Ave., Cleveland 3, Ohio		Lewis Welding & Engineering Corp.	121	Trerice Co., The H. O.	54
Crown Rheostat & Supply Co.	23	106 Northfield Rd., Bedford, Ohio		1424 W. Lafayette Blvd., Detroit 16, Mich.	
3465 N. Kimball Ave., Chicago 18, Ill.		L'Hammiedie & Sons Co., Chas. F.	5	True Brite Chemical Products Co.	139
Davies Supply & Mfg. Co.	55	4521 Ogden Ave., Chicago, Ill.		P. O. Box 31, Oakville, Conn.	
4160 Meramec St., St. Louis 16, Mo.		Lindale Equipment & Supply Corp.	155	Udylite Corp., The	25, 113
Davis-K Products Co.	128	504 Smith St., Brooklyn 3, N. Y.		Detroit 11, Mich.	
135 W. 29th St., New York 1, N. Y.		Macarr, Inc.	138	Unit Process Assemblies, Inc.	124, 146
Day Mfg. Co., Inc., The S. A.	145	2543 Boston Rd., Bronx 67, N. Y.		61 East 4th St., New York 3, N. Y.	
1483 Niagara St., Buffalo, N. Y.		MacDermid, Inc.	Back Cover	United Box & Lumber Co.	134
Dean Thermo-Panel Coil Div.,		Waterbury 20, Conn.		45 Wheeler Point Rd., Newark 5, N. J.	
Dean Products, Inc.	149	Macnason Products, Inc.	120	U. S. Galvanizing & Plating Equipment Corp.	66
613 Franklin Ave., Brooklyn 38, N. Y.		50 Court St., Brooklyn 1, N. Y.		31 Heyward St., Brooklyn 11, N. Y.	
Deering Milliken & Co. Inc.	60, 61	Manhattan Rubber Div.,		Universal Foundry & Machine Co.	54
1045 Sixth Ave., New York 18, N. Y.		Raybestos-Manhattan, Inc.	133	14841 Meyers Rd., Detroit 27, Mich.	
Detroit Chemical Industries, Inc.	123	6 Willett St., Passaic, N. J.		Victor Chemical Works	6, 7
Box 501, Detroit 32, Mich.		Matchless Metal Polish Co.	48	155 No. Wacker Dr., Chicago 6, Ill.	
DeVilbiss Co., The	32	840 W. 49th Pl., Chicago 9, Ill.		Wagner Brothers, Inc.	45
Toledo 1, Ohio		Metal & Thermit Corp.	19, 68	418 Midland, Detroit 3, Mich.	
Electro-Glo Co.	62	Rahway, N. J.		Williamsville Buff Div.,	
1430 So. Talman Ave., Chicago 8, Ill.		Michigan Buff Co.	155	The Bullard Clark Co.	28
Electrochemical Products Co.	150	3503 Gaylord Ave., Detroit 12, Mich.		Danielson, Conn.	
2800 W. Glendale Ave., Milwaukee 9, Wisc.		Michigan Chrome & Chemical Co.	8	Worklon, Inc.	137
Electronic Rectifiers, Inc.	142	8615 Grinnell Ave., Detroit 13, Mich.		253 W. 28th St., New York, N. Y.	
2102 Spann Ave., Indianapolis 3, Ind.		Miller Corp., Harry	39	Worthy Products Co.	159
Engelhard Industries, Inc., American Platinum		4th & Bristol Sts., Philadelphia 40, Pa.		Box 3415, St. Paul 1, Minn.	
& Silver Div.	18	Mitchell-Bradford Chemical Co.		Wyandotte Chemicals Corp.	53
231 New Jersey R. R. Ave., Newark 5, N. J.		Wampus Lane, Milford, Conn.		Wyandotte, Mich.	
Enthone, Inc.	3	Motor Repair & Mfg. Co., The	155	Zialite Corp.	148
442 Elm St., New Haven, Conn.		1555 Hamilton Ave., Cleveland 14, Ohio		92 Grove St., Worcester 5, Mass.	
Federated Metals Div., American Smelting &		Murray Way Corp.	21		
Refining Co.	27	P. O. Box 180, Maple Rd. E., Birmingham, Mich.			
120 Broadway, New York 5, N. Y.					

Manufacturers' Literature

Deburring Machines

Acme Mfg. Co.

A new 12-page, two-color, profusely illustrated catalog describes a line of automated deburring machines. The application of various types of deburring tools is discussed in detail in an introductory section. Tools described include wire brushes, abrasive belts, abrasive disks, Tampico brushes, special brushes, polishing wheels, grinding wheels, files and milling cutters.

The balance of the catalog is devoted to illustrations and descriptions of a wide variety of automatic deburring machines ranging from types specifically designed for low and medium-volume production plants to completely automated types for high production lines.

189/Circle on Readers' Service Card

Demineralization

Graver Water Conditioning Co.

Dealing with one of the most important phases of water treatment, bulletin WC-111A will be of interest to all engineers and chemists dealing with water and liquid treatment for process or boiler feedwater use.

In addition to several basic sections on the application of demineralizers, their basic principles of operation and the chemistry of the ion exchange resins, this bulletin includes detailed information and charts on materials of construction and the design of component parts.

Other sections are devoted to automatic control, regenerating systems, chemical handling and conductivity measurement. Details of several important accessories are discussed. Of particular interest will be the section on estimating operating costs for various types of systems and the tables of useful data.

190/Circle on Readers' Service Card

Hose Catalogs

*Manhattan Rubber Div.,
Raybestos-Manhattan, Inc.*

Eight new catalog sections on hose cover most of the industrial types of rubber hose with detailed illustrations,

data on construction, service, sizes, pressures, weights, and fittings.

These sections are: M610 Air, M620 Water, M630 Steam, M640 Water Suction, M650 Petroleum, M660 Industrial Fire, M670 Spray and Welding, M680 Special Service. Copies are available by specifying section numbers desired.

191/Circle on Readers' Service Card

Conversion Coatings For Aluminum

American Chemical Paint Co.

Bulletin 1424-A deals with company's line of protective and prepaint coating chemicals for aluminum. It discusses advantages of the coatings, methods of applications, and equipment used in the processes; also lists type metal products treated and includes convenient selection chart.

192/Circle on Readers' Service Card

Heating, Ventilating

American Air Filter Co., Inc.

Bulletin 701 includes illustrations and descriptions of a line of convactor radiators, finned radiation, unit heaters, console heaters, propeller fans, unit blowers, industrial exhausters and centrifugal fans.

17 tables and charts outlining performances, capacities, dimensions, range, CFM and HP motor ratings, as well as numerous arrangements of units, are shown.

193/Circle on Readers' Service Card

Fabricating Stainless Steel

Allegheny Ludlum Steel Corp.

A new 386-page book on the fabrication of stainless steel has more than 140-photographs, 120-charts and graphs, and about 200-special diagrams

May 1958

READER SERVICE DEPARTMENT — METAL FINISHING

THIS CARD MUST BE USED BEFORE JULY 1, 1958																			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210										

We regret that we must limit processing to ten inquiries per card.

Name (Please Print) _____ Position _____

Company _____

Street _____

City _____ Zone _____ State _____

We manufacture (products) _____

Postage
Will be Paid
by
Addressee

No
Postage Stamp
Necessary
If Mailed in the
United States

BUSINESS REPLY CARD

First Class Permit No. 46 (Sec. 34.9 P.L.G.R.) Westwood, N. J.

READER SERVICE DEPARTMENT

METAL FINISHING

PEOPLES TRUST BUILDING

WESTWOOD, NEW JERSEY

on the making of this versatile metal into usable products.

In addition, there is a complete section of almost 30 special reference tables on stainless steels. A detailed index for cross reference purposes is included in the hard-backed book.

The book has nine chapters, and goes into detail on every common method and practice for the successful fabrication of this metal. The section on finishing is very detailed.

194/Circle on Readers' Service Card

Water Treatment

The Permutit Co.

"Outline of Modern Water Treatment Equipment" (Bulletin 4433) lists water impurities and methods of treatment, illustrates typical treatment systems and describes aerators, deaerators, precipitation equipment, filters and ion exchange equipment. It tells

how each piece operates and gives its advantages, limitations, range of flow rates, etc.

195/Circle on Readers' Service Card

Electrostatic Painting

H. G. Fischer & Co.

A new 74-page General Engineering Manual covers the above manufacturer's newly developed electrostatic painting systems. This manual is available to anyone planning a new painting system and serves as a guide in designing the proper type of system for maximum economy.

It also describes an engineering service and a laboratory testing service provided without charge or to help solve industrial painting problems and determine the feasibility of adapting a standard electrostatic painting system to each specific application.

196/Circle on Readers' Service Card

PVC Linings

Kaykor Industries, Inc.

A new handbook Manual LC-58, covers the three most useful types of polyvinyl chloride lining for corrosion protection.

In addition to a general introduction to PVC lining applications and practices, specific attention is paid to the individual characteristics of conventional flexible lining, special non-toxic white PVC flexible lining, and the recently introduced unplasticized PVC lining, called "Fligid."

A table which should prove valuable to anyone faced with corrosion problems compares both conventional and unplasticized linings in terms of their resistance to a wide range of acids, alkalis, salts, plating solutions, organic compounds, and miscellaneous liquids. Materials are evaluated at 70, 120, and 160F.

197/Circle on Readers' Service Card

Industrial Rhodium Plating

Sel-Rex Corp.

A new 24-page booklet tells where, when and how to use rhodium electroplate for electrical, electronic and other exacting industrial applications. The booklet gives a detailed analysis of advantages rhodium will provide in specific applications.

The literature features graphs and charts showing rates of deposition under various operating conditions. Some of the detailed information provided are bath preparation and control; determination of rhodium in plating solutions; equipment required; current densities, and general operating instructions. A workable formula for computing cost is also included, along with information in Rhodex, a proprietary bath.

198/Circle on Readers' Service Card

Bufs

Hanson-Van Winkle-Munning Co.

A new 12-page bulletin describes a complete line of cutting and coloring buffs. Stressing importance of correct selection of a "job-tailored" buff, the bulletin devotes separate sections to description and illustration of each of a comprehensive range of buff types with the manufacturer's recommendation as to applications for which each type is best suited.

Range of specifications for each type is given, including grades of cloth, inside and outside diameters, diameters of arbor holes, thicknesses, densities and sewing patterns. Additional varieties are set forth.

199/Circle on Readers' Service Card

Postage
Will be Paid
by
Addressee

No
Postage Stamp
Necessary
If Mailed in the
United States

BUSINESS REPLY CARD

First Class Permit No. 46 (Sec. 34.9 P.L.&R.) Westwood, N. J.

READER SERVICE DEPARTMENT

METAL FINISHING

PEOPLES TRUST BUILDING

WESTWOOD, NEW JERSEY

READER SERVICE DEPARTMENT — METAL FINISHING

May 1958

THIS CARD MUST BE USED BEFORE JULY 1, 1958

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165
166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195
196	197	198	199	200	201	202	203	204	205	206	207	208	209	210

We regret that we must limit processing to ten inquiries per card.

Name (Please Print) _____ Position _____

Company _____

Street _____

City _____ Zone _____ State _____

We manufacture (products) _____

Another plating problem solved by Sel-Rex!


FEDERAL TELEPHONE & RADIO IMPROVES ELECTRONIC COMPONENT RELIABILITY WITH SEL-REX BRIGHT GOLD

Plated with only twenty-millionths of an inch of Sel-Rex Bright Gold over 0.001" of silver, sand-cast bronze electronic chassis showed no evidence of corrosion after a 65-hour salt spray test. This was proved at Federal Telephone and Radio's Clifton, New Jersey plant.

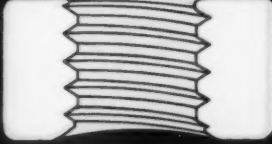
Sel-Rex Bright Gold is used on a variety of electronic parts at Federal because, to quote Mr. William F. Boyle, Chief Metallurgist, the deposits are "... fine grained and dense, giving exact duplication of the surface plated ... (it) eliminates galling in sliding electrical contacts" and has "effected a tremendous saving" over previous materials and methods.

These reasons, and many others, also explain why the instrumentation of the newest rockets, guided missiles, the earth satellites and many of the "hottest" airplanes have Sel-Rex Bright Gold on their electronic equipment and circuitry.

Whatever your plating problem—precious metals, power, equipment or procedures—Sel-Rex Representatives are trained to "Custom Engineer" solutions to our mutual profit. Send for FREE technical data and other case histories, and see for yourself ... we may have solved your problem last month.



Printed circuit panels with bright gold plate eliminates need of air conditioned cabinets to prevent migration. The Gold does not oxidize, makes good soldered joints for all electrical work.



Enlarged view of cross section of 5/6" hex nut showing uniform depth of gold plate even at the bottom of the threads. Solution throws uniform depth of gold plate without special anodes.

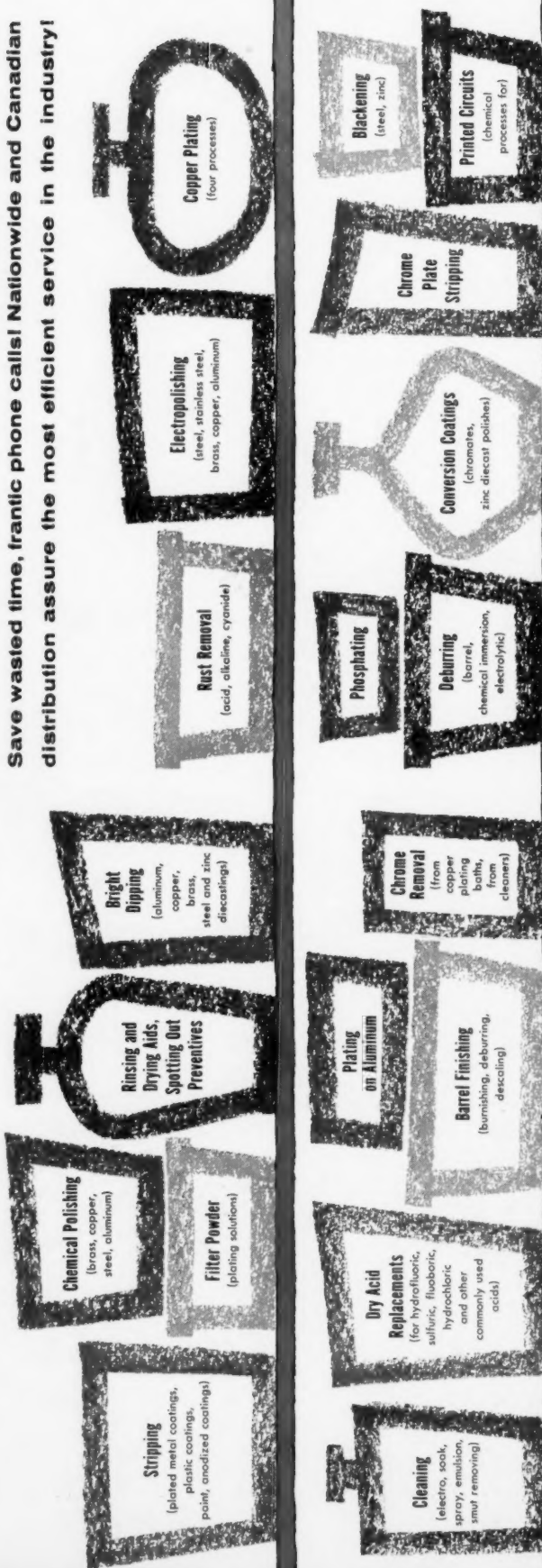
Sel-Rex
®

SEL-REX CORPORATION
NUTLEY 10, NEW JERSEY OFFICES: DETROIT - CHICAGO - LOS ANGELES

Manufacturers of Exclusive Precious Metals Processes, Metallic Power Rectifiers, Airborne Power Equipment, Liquid Clarification Filters, Metal Finishing Equipment and Supplies.

Only MacDermid offers metal finishers this "supermarket"

Save wasted time, frantic phone calls! Nationwide and Canadian distribution assure the most efficient service in the industry!



MacDermid
...right to the Finish!

MacDermid Incorporated
Waterbury, Connecticut, PLaza 4-5171
Ferndale, Detroit, Michigan, Lincoln 6-0064
MacDermid Pacific, Torrance, California, Davis 3-6292

The MacDermid Man draws on the broadest line of metal cleaning, plating and finishing processes available today... he has complete cycle know-how.

Write for complete technical data sheets on any or all of these MacDermid processes. Your MacDermid representative has *ServiceAbility* to assist you with your *entire* metal finishing operation... he's a good man to know!

COMPLETE SUPPLIERS TO THE METAL FINISHING INDUSTRY